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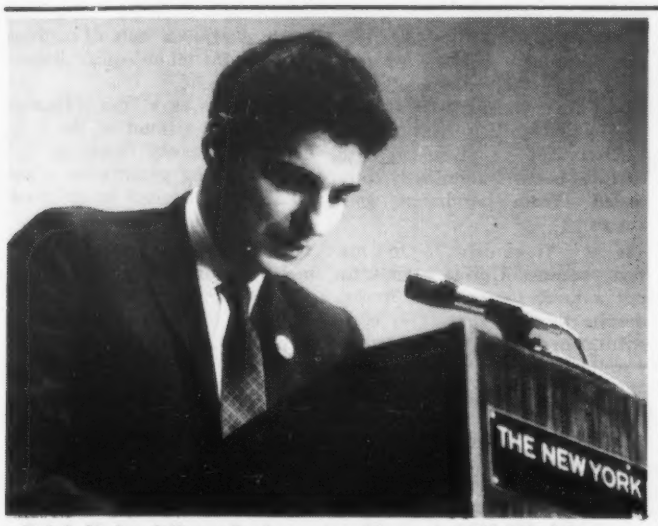

Ralph Nader delivers the keynote address at ACM '70. (story on Page 4).

Nader Leads Public At ACM's Convention

By Joseph Hanlon
CW Staff Writer

NEW YORK – ACM took a first step here last week to bring the computer to the general public at ACM '70 – the "unconventional convention" – but attendance results were below expectations.

Approximately 2,000 people came off the street and paid the $2 fee to look at the exhibits, and around 600 of the 2,000 technical registrants were professionals from outside of the computer industry, according to ACM.

10,000 Expected

ACM had hoped to lure up to 10,000 members of the general public to the open, educational exhibits and some ACM sources indicated that the conference would not pay its way unless there were 2,000 full registrations, and 5,000 registrants for the exhibits.

The ACM, however, came under attack for not doing enough to interest the general public in computers. Several speakers, including keynoter Ralph Nader (see story on Page 4), called on the organization to take more responsibility for the effects of computers on the outside world.

Seventeen exhibitors attempted to show the public what a computer could do. But the exhibits also demonstrated that people are still more important; attendees gravitated to those exhibits where live people explained "what was happening."

The Resistors and Mead Data Central drew the largest crowds. Mead was tied to a large data base, and visitors could use the terminals to ask non-technical qustions, such as what shows to see, or technical questions, such as one about Ohio state law.

None of the exhibitors demonstrated systems such as the ones criticized by the speakers – there were no demonstrations of

(Continued on Page 4)

DPF&G and IBM Settle Suit; ADR Keeps Autoflow Rights

By Edward J. Bride
CW Staff Writer

NEW YORK – Data Processing Financial and General Corp. (DPF&G) has dropped all charges against IBM, leaving only Control Data Corp. and the U.S. Government in antitrust litigation against the industry giant.

DPF&G announced the out-of-court settlement last week, and IBM confirmed that the terms involve refinancing the leasing company's $42 million debt to IBM, plus remuneration for "legal costs."

A spokesman for DPF&G would not reveal the exact figure of the settlement, but indicated it was "substantially in excess of half a million dollars." The refinancing of the debt for computer equipment will stretch the payment period from about three years to five years.

Consolidated Complaints

The suit had been consolidated with three other antitrust complaints, in Federal Court in Minneapolis. Two weeks ago, Applied Data Research and Programmatics settled out of court, obtaining $1.4 million for costs [CW, Aug. 26].

DPF&G President Ryal R. Poppa, who left the presidency of another leasing company this summer to take his current job, indicated that the refinancing would help his concern's cash flow by about $30 million over two years. The company reported a net loss of $4.3 million in fiscal 1970, after a profit of $8.2 million the year before.

The DPF&G suit, and the other still pending (CDC's), both charge that bundling constituted antitrust practices, and sought damages plus the "unbundling" which occurred last year.

In addition, the DPF&G suit sought to break up IBM into four separate corporations, IBM the computer maker plus three others. The other companies could not use the initials of IBM, nor any of its personnel or working spaces without compensation.

IBM confirmed the details of the settlement, but had no further comment.

Control Data had no comment, other than to say that this third out-of-court settlement would have no effect on its suit.

Applied Data Research Inc. (ADR), which, along with its subsidiary Programmatics Inc., settled two weeks ago [CW, Aug. 26], revealed last week that the company would retain exclusive U.S. marketing rights to the successful Autoflow program.

IBM confirmed that the giant manufacturer might have some "very limited" marketing of the debugging/flowcharting program in some overseas areas, but declined to speculate on the extent of this arrangement.

Operable in Mid-'70s

Bell Digital Network Predicted

By Ronald A. Frank
CW Technical News Editor

NEW YORK – A new AT&T data network using long-haul digital carrier systems with both microwave and coaxial cable technologies will be ready for operation in the mid-1970s, William Ellinghaus, executive vice-president of AT&T, predicted here last week.

Speaking before communications users attending the Conference on the Revolution in Transmission of Business Information, Ellinghaus outlined AT&T plans to increase the data handling capabilities of the Bell system.

Ellinghaus, who on the first of this month was named president of the New York Telephone Co., said the new digital network will initially serve 60 major cities with a variety of data speeds desired by communications equipment manufacturers.

'Only a Few Seconds'

The network will offer data users call completion times including dialing, switching, and ringing of "only a few seconds," Ellinghaus said. "Ultimately, we expect to have these set up times under one second," he predicted.

Initially a data network offering private line service will be in operation by "late 1973 or early 1974," he said, with later switched data service linking "most of the major cities in the U.S." scheduled "soon after."

He said this expansion of facilities will include utilization of domestic communications satellites, millimeter waveguides, and lasers, as well as high-capacity coaxial cable systems.

Stating that more and more Bell data facilities would be converted to digital operation, he said the proposed waveguide system would be entirely digital in nature.

Ellinghaus told the conference that the expansion of Picturephone service to eight cities by next year will include a high-speed data transmission system providing transmission speeds of 1.3 Mbit/sec.

David H. Foster, vice-president of Data Transmission Corp. (Datran), said that even with IBM domination the computer industry had experienced considerable growth through competition. By contrast, he said data communications has been subjected to "slow begrudging growth characterized by user frustration."

Foster predicted that the Datran network would meet AT&T's planned one-second connect time.

System Offers More for Less

By Frank Piasta
CW Staff Writer

CUPERTINO, Calif. – A System 360 user who has the IBM 2848/2260 display system will be able to replace it with a system from Four-Phase Systems, Inc. for about one-half the cost, and get the processing power of a medium-scale business computer as a bonus.

The "System IV-70," structured around a byte-oriented computer with a semiconductor memory and as many as 32 terminals, is initially being offered as a plug-to-plug replacement for the IBM displays and controller.

The manufacturer stresses that IBM OS and DOS (BTAM and QTAM) software needs no modification to operate with the System IV-70. The System IV-70 software uses its foreground mode to simulate the IBM terminals, and its background mode for other processing.

Preprocessing

Since the company estimates that only 10% to 20% of the System IV processor power will be required for normal communications and terminal activity, and the computer has internal processing speeds approximately equal to the IBM 360/30, the power available would make a high degree of data preprocessing possible.

How does the Four-Phase processor compare with other small computers? The most unusual aspect of the Four-Phase machine lies in its decimal handling capability, as opposed to the binary orientation of most minis. While many minicomputers can handle 8-bit segments, a conversion process has to be used to convert the output to Ebcdic format. The Four-Phase processor has Ebcdic as its native code.

The cycle time of the Four-Phase, at 1.9 μsec/3 bytes, works out to an average of 633 nsec/byte, faster than all but a

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Software Firm Files Suit Seeking to Unbundle Univac

By Edward J. Bride
CW Staff Writer

NEW YORK – "Unspecified costs and customer confusion don't belong in today's business," says the Univac Division of Sperry Rand, in its current advertising campaign.

"That's why we'll continue to include [software and services] in the price of our computer systems," the ad continues.

That advertisement is part of the evidence in an $11.5 million antitrust suit filed against Sperry Rand by On-Line Software, Inc., in the Federal Court's Southern District of New York.

The local company charges that Univac hurt its business by offering free software and services for the Univac 494 real-time system and, by so doing, violated the Sherman and Clayton Antitrust Acts.

On-Line President Jack Berdy said his "primary objective" is forcing Univac to unbundle.

The suit charges that Univac has a "pseudo-price of zero-dollars" for software, denying users the "benefits of competition on both quality and price."

It also alleges that this bundled marketing position has forced users to pay for "unneeded and unwanted" software and to pay "unreasonably high prices" for both hardware and software.

The quality of Univac software is also a major point at issue, for On-Line contends that Univac customers "have been forced to use defendant's software of substantially lower quality and of more limited variety than is available" elsewhere.

The suit says that Univac's packages are "inefficient in execution and excessive in size," and thus inhibit the marketing of smaller-sized, lower-priced hardware systems.

The $11.5 million being sought is the standard treble damages, for loss of profits and "retarding of economic and technological growth" of the former Univac programmers who comprise On-Line Software.

'Excessive' Taxes

Another disadvantage of "bundling" is forced upon *purchasers*, says On-Line, because state and local sales, excise, use and personal property taxes are based on the physical, tangible property – the hardware. Since software and services are "constituent elements" of the bundle, On-Line contends, such taxes become naturally "excessive."

To add insult to injury, these taxes are imposed even if the purchaser does not intend to use the "inferior" software or services, the company adds.

On-Line claims that software approximates 35%-50% of the total cost of a system, and this cost has been "fraudulently concealed" from purchasers and lessees.

It is "fraudulent," On-Line says, because Univac refuses to put a price tag on these items, despite the fact that "they constitute not only an important selling feature, but frequently . . . the most important sales factor."

There are other charges, too, such as inhibiting the development of the software industry. These are not new, but are reiterated rather emphatically when the 27-page complaint alleges that Univac was "attempting to develop a state of confusion as to the tehnological character of software."

The suit says that Univac "committed a fraud on the U.S. Patent Office by applying for and obtaining patents for computer systems based on software but disguised as hardware."

Univac lawyers were "studying" the complaint, and had no official comment. A reply is due Sept. 16, 20 days after the suit was served.

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Urges Data Bank Supervision

Nader Warns of 'Slave Nation'

NEW YORK – Computers may make the U.S. a "nation of slaves" unless their use is controlled and regulated, according to Ralph Nader.

Keynoting ACM '70, the "consumer crusader" called the massive banks of personal data held by the government, credit bureaus, banks, and insurance companies a "perilous threat to civil liberties." He advocated creating a federal regulatory agency to supervise all data bank operations.

Nader warned that unless the current situation is changed there will be "mass antipathy" and "citizen backlash" toward computer technology.

Producer Control

Part of the problem, Nader claimed, is that "computer technology develops as the exclusive preserve of those who produce computers . . . ."

Because of producer control, the needs of the manufacturers have taken precedence over the needs of the consumers.

"The relationship of the consumer and the computer should be a major concern of *someone* in this society," he stressed, and suggested that members of professional societies, such as the ACM, should take the initiative.

Bill of Rights

In his speech, Nader also criticized two areas in which computers result in misuse of information – invasion of privacy and increase in governmental secrecy.

The citizen needs an "information Bill of Rights," Nader argued, to protect his privacy. Such rights would include the right to see information about yourself and the right to a hearing to challenge inaccurate data.

On the other topic, Nader noted that "information is currency of power," and that governments are reducing the citizen's access to that information just at the time that proliferation of computers has vastly increased the amount of data collected.

"Citizen access to government information has never been so limited," Nader charged.

He concluded: "The increasing interdependence of complex society and the increasing delegation of responsibility to machines must concern more than just science fiction writers. The professional has a responsibility to pose new challenges and old problems that will not be met by market forces."

Help Consumers

One application of computers that Nader urged is to "balance the buyer and seller in terms of bargaining power and knowledge." Computer systems could be used, he said, to "provide awareness as to significant differences in products and allow the consumer to reward makers of superior products."

For example, computers could determine quality, efficiency, and safety of various automobiles and then provide this information to the buyers.

Nader also suggested two ways in which computers could aid insurance buyers, by providing usable comparative information on the fine print of insurance policies, and by computing repair costs and accident proneness of cars to enable insurance companies to set lower premiums for safer cars.

At a press conference following the speech, Nader stated that he had no plans to investigate the computer industry. He is, however, collecting information on ways in which computers could help consumers and asked computer professionals with information to write him at 1908 Q St. N.W., Washington, D.C. 20009.

High Schools Get Pamphlet

BONN, West Germany – All high schools in the Federal Republic will receive a pamphlet entitled "Modern Mathematics Teaching" which describes using a computer to teach mathematics.

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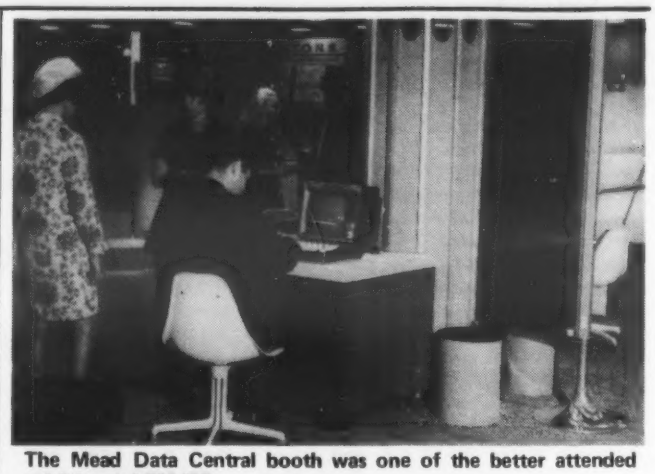


The Mead Data Central booth was one of the better attended exhibits at ACM '70.

Nader Leads Consumers At 'Unconventional' ACM

(Continued from Page 1)
large credit data banks or criminal information systems.

Walter Carlson, president of ACM, said that several users of this type of system had been invited to exhibit, including the FBI, but all had declined.

Technical Sessions

ACM '70's technical sessions attempted to begin a dialog between computer people and those who could use computers to fight urban blight, reduce pollution, aid medical research, and more efficiently administer aid programs.

Speakers ranged from researchers describing their computer needs to computer professionals talking about the potential of the machine.

Sometimes a dialog resulted, but at other times papers were highly technical and the meetings began to take on the look of a typical computer conference.

Sometimes, too, the computer people seemed out of touch with the problems. One speaker in a session on urban problems said that our cities were in better shape than ever, that "we are not choking in traffic," and that there is a smaller percentage of poor housing than ever before. The real problem, he said, was "galloping expectations."

Walter Carlson said that reaction to the meeting was "well above our most glowing expectations," despite earlier suggestions that as many as 10,000 people might come in off the street.

Carlson suggested that the success of the show might necessitate changes in the format of next year's show in Chicago. He said that discussions are now going on with Fred Harris, exhibits chairman for next year, and others, to determine whether the "unconventional approach" should be continued.

New CRT System Offers More for Less

(Continued from Page 1)
few of the current minis. This speed plus the savings inherent in the elimination of software radix conversion routines seems to make the Four-Phase CPU a very effective device for business-oriented data processing.

96K Bytes

The maximum memory capacity of 96K bytes of the Four-Phase processor places it among the very largest minicomputers. A 360 user would have to go to the Model 40 in order to get this much memory.

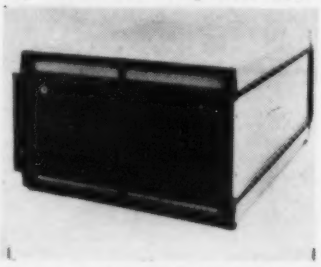
Bearing out the claims for CPU power are the specifications of the processor. Internal speed is 1.9 μsec/3 bytes (24 bits), cycle time. The timing for a character move is 2.5 μsec/byte, a character compare takes 3.8 μsec/byte, a decimal add/subtract requires 5.1 μsec/byte, while a binary add/subtract of fields 24 bits in length can be accomplished in 15.2 μsec.

A 6K byte read-only memory (ROM) is standard equipment with each processor. It is not user-programmable. Main memory starts at 6K bytes, and can be expanded in 6K byte increments to a maximum of 96K bytes. Memory is entirely of semiconductor construction and so has the possible disadvantages of volatility and destructive read-out common to this technology.

The instruction set consists of 120 major instructions including variable length byte instructions, binary fixed and floating point arithmetic, translate/test, push/pull stacks, register to register, and list processing instructions. Several commands, including decimal add and subtract, move character string right (and left) and compare string instructions, are available as an extra-cost option.

Instruction Set

The instruction set is similar to, but is not compatible with the IBM 360, primarily because the System IV-70 is a single-address machine. Incompatibility also extends to some extent to data structure, as the new system has no facilities for packing or unpacking decimal data, nor for performing packed decimal arithmetic.



The System IV-70 display processor takes up less than two and one-half cubic ft.

A less prohibitive restriction deals with binary calculations. Due to discrepancies in word length (24 for the System IV-70 vs. 32 for the 360), single precision on the 360 would require double precision on the System IV, and fields set up for double precision on the 360 could not be used without truncation and/or loss of precision.

The maximum I/O rate is 265K byte/sec. Eight I/O channels are provided. Eight is also the number of levels of nested hardware priority interrupts, with a single I/O interrupt instruction wired into the ROM.

The basic processor with 6K of memory and 6K of ROM can control up to 16 terminals. It has a selling price of $7,500. The optional instructions would add $1,200 to the processor price.

The terminals are priced at $980 each, complete with keyboard. Up to 32 terminals may be attached to a processor. A complete 32-terminal system, according to the company, with a 24K CPU, disk drive, communications interface and printer would cost $62,400, or $1,950/terminal.

The first System IV-70s will be ready for customer delivery in January 1971, the company said.

Four-Phase Systems, Inc. is at 10420 N. Tantau Ave.

Massachusetts DP Jumble Grows Darker As Improvement Bills Die in Legislature

By Edward J. Bride
CW Staff Writer

BOSTON – The official mess of data processing in Massachusetts will continue for at least another year, thanks to the slow political death of two bills intended to improve management and impose tighter budget restrictions.

Alvin Kaltman, director of the Massachusetts Bureau of Systems Analysis, Data Processing and Telecommunications, suggested that, since the Massachusetts Legislature has adjourned until after the November elections, both bills, or a possible compromise measure, have been eliminated.

The bills were filed in reply to a damning report issued by the state Commissioner of Administration, Donald R. Dwight, who also proposed one of the bills and who is now a candidate for lieutenant governor.

Several weeks after Dwight's bill was assigned to the Joint Rules Committee, a similar bill was proposed by the Special Joint Legislative Committee Investigating the Use of Electronic Data Processing Systems. The committee was created last year, and became active shortly after the initial Massachusetts report last Spring [CW, April 1].

After a brief furor on misuse, underuse, overpayments and some allegations of incompetence, the statewide controversy died down. Some office-seekers mentioned it in various speeches over a period of a week or 10 days, but the issue was never pushed by the administration of Gov. Francis Sargent, who is seeking his first full term with Dwight as his running mate.

Kaltman has thus been deprived of the authority to coordinate EDP equipment purchases and assign workloads among the several keypunch and processing centers.

ACM Urban Panel Urges Systems Analyst Role Change

By Joseph Hanlon
CW Staff Writer

NEW YORK – Systems analysts working on urban problems should deal with the small problems that can be solved, and ignore the large, intellectually satisfying problems with no immediate solution, according to the major speakers at the ACM symposium on the Application of Computers to the Problems of Urban Society.

One speaker, Dr. Herbert R.J. Grosch, urged systems analysts who are assigned large systems to ignore their instructions and work on a simpler problem.

The speakers argued that the most difficult aspects of urban problems have nothing to do with computers, and criticized many of those working in the field for failing to do the non-computer work necessary to implement their systems.

Several speakers criticized present analysts for trying to solve entire problems. They argued that the proper role of a systems analyst was to provide an analysis of the various options so that the actual decisions could be made through the political process.

The symposium is an annual meeting sponsored by four New York area chapters of the ACM. This year it was scheduled for the day before ACM '70 so that participants could attend both. Attendance at the one day meeting was 220, less than the 240 of last year, and considerably less than the 300 expected.

Programming 1% of Job

Keynote speaker Charles Miller, director of the MIT urban systems laboratory, de-emphasized the role of computers in solving urban problems. Computer programming is only 1% of the job, he declared.

The rest is implementation, he continued, which does not mean just a feasibility study. Putting a system into day-to-day operation is the job of the systems analyst, and not someone else, Miller said.

Freezing present government procedures into computer systems "will make more of a mess" than just leaving the present manual systems, Miller warned. Systems analysts must consider the overall operation, and decide what procedures are really needed.

Where unnecessary procedures are required by law, Miller continued, analysts "may find that it is more important to write new legislation than to write computer programs." The purpose of such legislation should be to benefit the average citizen, not to make things easier for the systems analysts, he said.

Work on Small Blocks

Grosch urged those working on urban systems to work on small blocks, such as payroll, that are sure of success, and then try to put the blocks together.

Such an approach will require reprogramming of the separate blocks to make them go together, but it is better than working first on the entire system, because that approach will not work at all, he declared.

Despite his recommendations, Grosch held out little hope for computers to solve urban problems. One problem is money.

"The major area of funding for urban research is law and order. The government will wheel out carts of money to spend on Mace, armor, and crime information systems, but will give little money to other needs such as pollution or schools," he declared.

Participants in a panel discussion on using computers for allocation of urban resources stressed that the role of computers was as an aid to the normal decision-making procedure.

David Grossman, deputy director of the budget for New York City, said his agency was trying to set up procedures "to analyze the problems of the city and provide measured options to the decision makers."

To Marvin L. Manheim, MIT civil engineering professor, this is not good enough, the analyst must "create political controversy around the issue he is studying" and provide information to the community for its use. Only then, he said, will all of the involved groups be able to work out an acceptable solution.

Computer Bomb Damage Studied

CW Midwest Bureau

MADISON, Wis. – FBI agents, Army investigators, and Madison and Wisconsin State Police are still probing through the debris of the bomb-shattered Sterling Hall on the campus of the University of Wisconsin, where two weeks ago an explosion, allegedly detonated by a radical group, tore out the wall of the Army Mathematics Research Center housed in the building.

A spokesman for the university's main computer center, who was allowed to visit but not photograph the damage, told CW about the damage to the computer equipment.

"The CDC 3600," Wayne Rayfield, University Computer Center director, said, "looks pretty bad. There's a lot of broken glass and external damage, but we won't know just exactly how bad the system is until we get some CDC men in there to look it over."

Rayfield said that the Honeywell DDP 124 was ruined. The Univac 9300, used by the math center as a terminal for the Univac 1108 in Rayfield's center four blocks away, is a question mark, Rayfield said.

He said it appeared to be all right, but he felt the bomb's blast probably jarred its internal circuitry loose. He said he couldn't be sure of its condition until representatives of the manufacturer examined it. The 9300 was on the north side of the building, he pointed out.

A definite survivor of the explosion was the SCC 4700, which was on the top floor of the building and, again, on the side away from the actual blast.

According to Rayfield, the destruction of the DDP 124 destroys five years of the center's work in the field of low energy physics.

While the CDC 3600 was the target of the radical groups on Wisconsin's campus since, they felt, it was used in weapons research, Rayfield stated that the system had not been used since last April.
was, in fact, up for sale.

He also stated that the computers were not being used for secret military research, as was claimed by some of the students after the bombing.

Pssst...don't tell

SBC Clarifies Position

Program Development 'Grey Areas' Get Some Light

By Edward J. Bride
CW Staff Writer

WHITE PLAINS, N.Y. – Service Bureau Corp. (SBC) has attempted to clear up what many other time-sharing companies consider a "grey area," that of customer-requested program development.

In recent letters to customers of its Call/360 service, the IBM subsidiary also announced a new billing procedure for storage, resulting in "identical" or lower rates for most users, a company spokesman said.

The company said that a new amendment to time-sharing contracts will "clarify the subject of customer and SBC rights and responsibilities with respect to . . . library programs" plus customer programs and modifications.

According to the company, if programs are developed with SBC assistance "for the Call/360 time-sharing service, such programs will be jointly owned by the customer and SBC." The development of these programs, a spokesman noted, is on a no-cost basis; therefore, the joint ownership.

If a customer desires modifications to SBC library programs, this is accomplished under the basic Call/360 contract, at no cost, and the modifications become the property of both SBC and the customer.

Presumably, the customer could then use the modifications if he left SBC for another time-sharing service which utilized similar programs.

A prepared statement from SBC last week also stated that the company "will not be responsible for programs written with SBC assistance" and that the customer has no rights to applications programs in the SBC library.

Other time-sharing customers indicated that it is fairly standard for a company not to assume responsibility for a program written under the supervision of a user.

SBC explained further that, if the program is written under the user's *supervision*, then the company considers the *user* to be programming.

A spokesman also emphasized that this is not a new policy, merely the written clarification of what has always been done in practice.

"Short-Term" Storage

The storage rates were to go into effect Sept. 1, and were changed to provide a "short-term daily storage facility, in addition to the monthly" billing system, SBC noted.

An SBC official stated that the daily rate would permit the use of large amounts of storage for short periods at a "reasonable" cost. The official claimed that a user with an application, with fairly constant use, would see no change in his storage billing.

Under the old system, a user was charged $1.50 per storage block (3,400 bytes of permanent auxiliary storage) per month, based on his maximum storage.

Now, the price is the same, but it is based on his minimum use ("lowest peak storage allocation") during the calendar month.

Additional storage blocks are billed at 15 cent/unit, that is, per block per available day. The customer is entitled to access, as available, a Call/360 system during hours of daily operation, including Saturday, and excluding SBC holidays.

A company official stated the following example of the effects on a "typical" customer:

A person using as few as 40 units for much of the month, and occasionally 100 units for a day or two, would formerly be billed for 100 units, or $150/mo. With daily pricing, the customer would be billed for 40 units for the entire month, or $60. In addition, he would be charged the daily storage rate for his excess, which works out to about $84 instead of $150.

The company indicated that the only customers who would pay more under the new system are those whose use necessitates "wide fluctuations lasting over 10 days."

The Case-by-Case Basis

Other service bureaus generally consider a program's performance part of the "grey areas" to be negotiated on a case-by-case basis.

As far as marketing rights and use are concerned, GE owns all rights to its own applications programs and modifications. However, as is the case with SBC, a customer can opt the contract programming arrangement, whereby the customer owns the program and all rights.

A grey area exists here, too, in that there is no specific point at which the company would recommend the contract programming option rather than a major, cost-free overhaul of a GE library program.

ComShare said its position "depends" on the nature of the program and the user. If a customer is spending $20,000- $30,000 a month, a spokesman indicated, then ComShare would "probably" take on the program development and let the customer keep the rights.

ITT Data Services also considers each case "unique." The customer who requests modifications is billed, but each case is negotiated as to who retains the rights. If the program is a generalized one, with apparent marketability, then an ITT spokesman stated he would consider a "joint venture" with the customer.

Tickets Track Violators

NEW YORK – The New Jersey Department of Motor Vehicles has agreed to let New York City use its computer to identify New Jersey drivers who ignore parking tickets received in that city.

If necessary, remiss drivers may be sued in their home state. The New York Parking Violations Bureau will send a list of New Jersey parking violators to Trenton, where the computer will print out the names and addresses.

The bureau will then issue warnings to these drivers.

System/370 is a highly advanced computer system.

Speed? System/370 Model 165 is up to five times faster internally than System/360 Model 65.

Core Storage? Model 155, for example, provides you with the greatest range we've ever offered on a medium-sized system, up to two million bytes, and Model 165 has up to three million bytes.

So you can take advantage of multiprogramming. To handle more jobs at the same time.

Channels? Model 155 has six and Model 165 has 12. So information can get in and out of the CPU much faster.

Its high-speed disk file houses three and a half times more information than any file IBM has ever made. Up to 800 million bytes in all.

Its printer fires out words and numbers at the incredible rate of 2000 lines a minute.

All this is reason enough to consider moving up to System/370.

But it becomes all the more reasonable when you consider that all those advances were made while retaining compatibility.

Now you can move up to IBM System/370 and still keep using the same terminals.

The 370.

Now you can move up to System/370 and still keep using the same programs. All of which makes System/370 easy to install.

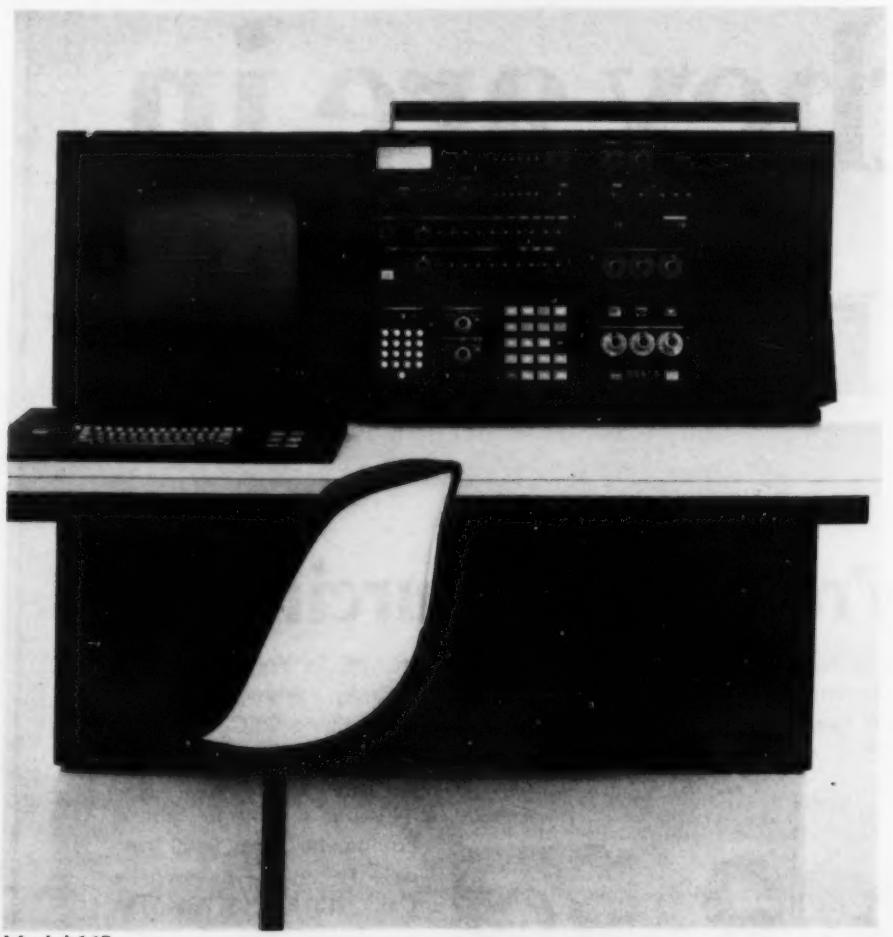
System/370's new monolithic circuit families give you more computing per cubic foot.

More computing. With compatibility.

You wouldn't want it any other way.

IBM

It's great to know it's compatible with the 360.



Model 165

IBM System/370: the computers for the seventies.

N.J. to Get First Computerized Toll Road

CW Midwest Bureau

NEW BRUNSWICK, N.J. – The Garden State will have the nation's first computerized toll road now that the Turnpike Authority has given the go-ahead to the Sperry Rand Corp.

According to Sperry Rand engineers, roadbed sensors will be imbedded to detect traffic congestion. The system will pinpoint the congestion on a display board at Turnpike Authority headquarters and reroute incoming traffic to avoid the buildup by triggering traffic signals.

An alarm will alert an operator of the system who can then dispatch a police patrol to the trouble site as highlighted on the display.

Congestion Clearance

Clearance of the congestion will be automatically noted, and the traffic flow released.

The system operator, according to Sperry Rand, can use the system to note both traffic speeds and volumes. The sensors, by measuring lengths of vehicles, will distinguish between automobiles and trucks or buses and record heavy duty traffic counts.

The data on heavy duty flow at any given point will then be available to the operator at the touch of a button.

Heavy duty flow per given tollway area will be displayed on the screen at the operator's request.

The system will also record and store data on volume of traffic, congestion, accidents, and equipment failures by area and time. The compilation of such data will be on a daily basis and will be stored for the authority's use in planning and traffic control.

Sperry Rand will design the system, which will cost the state $179,000 for the design and the mock-up, expected to be ready for inspection by November.

Installation of the system in the newly widened northern portion of the turnpike will cost between $1.9 million and $3 million, depending upon the number of magnetic loop sensing devices imbedded.

Air Pollutants Take Warning!

CW Midwest Bureau

TUCSON, Ariz. – A mathematician here at the University of Arizona believes the only way to control the pollutants poured into the air by industry is by computer.

Dr. John Bownds of the university, who is also chairman of the Group Against Smelter Pollution (Gasp) and cochairman of the Tucson Advisory Committee on Air Pollution, feels the problem of handling clean air is far too complex to be undertaken by anything but a computer.

"This is the most reasonable approach," he said. "It is much cheaper to run a computer simulation to establish what the control strategy should be than to have the individual pollutors install expensive equipment, only to find out later that it doesn't meet the standards."

Bownds has already set up programs on what he calls a "computer diffusion model." Working with the university's computers, Bownds determines emission standards – how much each pollutant source will have to cut back on a particular pollutant in order to meet the ambient standards at the test point.

Editorials

One-Sided Dialog

Early returns indicate that ACM's attempt to initiate "a dialog between the people being affected by computer technology and the people responsible for the technology" was only a moderate success.

Few of the "people affected" showed up, certainly fewer than ACM officials expected. Judged by attendance standards, the conference was a flop.

But the conference can't be judged by normal standards because new ground was being broken. It should be considered in terms of an "out of town tryout" or a test run.

We hope ACM officials won't be deterred from debugging the concept and running the conference again next year.

In a society where people are arrested by police on the strength of a computer printout and other people are blowing up computer centers with truckloads of dynamite, every attempt to mingle with the public must be considered not only a good idea but a vital project.

Letters to the Editor

'Fourth Generation May Be Here Now'

Most comments in the press concerning the IBM 370 interpret the new system as being an improvement in degree only over the 360, and no major technological advance.

All of the quoted experts may well be eating crow in the near future. Based on the somewhat sketchy information available so far, it is not unreasonable to hypothesize that System 370 is in fact a line of microprogrammable processors and storage elements, now configured and programmed primarily to simulate 360s.

At some later point, we may see the same hardware, with new internal control programs appearing to the user as an entirely different (and hopefully improved) machine. So the same hardware may continue to serve the 360 market and new users of a different virtual machine at the same time. The fourth generation may be here now.

Morton D. Cohan, Manager
Scientific Systems Planning

E.R. Squibb & Sons, Inc.
E. Brunswick, N.J.

We tend to agree. See CW, Aug. 26, page 41. Ed.

How Qualified Is Auditor on EDP?

Reference is made to the August 26 issue of CW to a front page article entitled "Florida Report Cites City DP Shortcomings."

The subject of this article is the efficiency or lack thereof in operating the EDP center of a municipality. Being a past municipal EDP director elsewhere, I feel somewhat qualified to make comments on this article and the apparent activities leading to it.

The first evident thought that comes forward is that an auditor, either internal or external to the city staff, is hardly qualified to make any critique in the EDP operations except those involving financial data. I would hope that there are other EDP operations.

A second thought is that the study was politically motivated i.e., in an effort to shove Bailey out of the door either because he was not politically active or tended to favor a power not then in, a report was requested and paid for from an agency that was not necessarily qualified, would favor the predetermined action, and in fact very probably miss the real point leading to EDP improvements.

A third thought is that long-range plans with priorities should be laid out and approved by some authority other than the EDP chief (probably the mayor, the EDP chief, and some ad hoc committee). Certainly a time element must be included in such plans, because even with my limited knowledge I suspect that the building of Rome did exceed one day.

Richard J. Tischhauser

Woburn, Mass.

D.C. Data-Line

How to End Evils of Private DP Schools

By Alan Drattell
CW Washington Bureau

WASHINGTON, D.C. – The tainted world of private data processing schools has been coming in for a great deal of scrutiny lately.

Tainted because of the number of fly-by-night and phony schools which have plagued the public, two EDP industry associations have been attempting to do something about protecting the consumer. The Data Processing Management Association and the Association for Computing Machinery have teamed to come up with a set of guidelines for private EDP schools.

However, their progress has been slow and the Federal Trade Commission will hold hearings here Sept. 15 on its proposed guidelines for private vocational and home study schools [CW, July 22].

Common Practices

In reaction to the report on the upcoming hearings, Robert E. Stout, director of admissions for an EDP school in Monsey, N.Y., Computer Skills, Inc., forwarded a list of common practices at private EDP schools and suggested recommendations for their elimination.

Stout's covering letter stated: "Ethical schools such as ours are being hurt the most by the wave of adverse publicity – which we agree is certainly warranted considering the current state of the industry.

"At Computer Skills Institute we have voluntarily pledged to abide by the guidelines set up by DPMA and ACM and, in many instances, have exceeded their minimum requirements."

CSI, according to Stout, has a physical plant occupying approximately 10,000 sq ft, which includes five classrooms and a computer laboratory that currently contains an IBM 360/30 with 32K core, two tape drives, two disk drives and a high-speed printer.

All members of the faculty, claims Stout, have college degrees, extensive experience in programming and have been approved by the State of New York Department of Education.

Courses given include computer programming (720 hours including 420 hours Cobol, 270 hours ALP and 30 hours introduction) and computer operations (250 hours).

Testing procedures involve the IBM Aptitude Test for Programmer Personnel (ATPP) for programming and for operation, the Punched Card Machine Operators Aptitude Test (PCMOAT).

Testing Procedure

Stout's list of common practices and suggested recommendations for their elimination involve testing procedures, faculty and placement.

On testing, Stout says: "The vast majority of schools give invalid aptitude tests that, by the wildest stretch of the imagination, could not be considered a valid measure of a person's basic aptitude for the computer programming field. Our suggested solution is to establish a standard test with minimum acceptable passing grades."

Stout continues: "The vast majority of schools do not grade even the invalid tests in the presence of the prospective student, saying that it will be graded later and if the grade is unacceptable, any monies paid will be refunded. The suggested solution is to make it mandatory that the school conspicuously post a sign stating the name of the test to be given, the minimum passing grade and that the test must be signed by the student certifying that it was graded in his presence."

Stout also says that many schools have the prospective student complete the test in pencil and then change the answers to bring the score up to an acceptable level. His solution: "Make it mandatory that the test be done in ink or marker pencil and that any necessary corrections made by the prospective student must be initialed by him."

Regarding faculty, Stout says that many schools have low standards, and in some cases are utilizing recent graduates of their own schools. His solution would be to make it mandatory that "outside the door of each classroom the teacher be required to post his certification by the state. Where a probationary instructor has the class, a copy of the letter to the state advising of his status should be so displayed."

Most schools, adds Stout, make exaggerated claims regarding placement of their graduates and also imply a guarantee of employment following graduation. He would "require each school to maintain a register by class, showing the number of dropouts, the number of failures, and *bona fide* placement activity giving the name of the company at which the student was placed and the starting salary received."

And most important, Stout emphasizes that all the guidelines in the world will have little effect on the unethical operators of EDP schools. What is needed, he says, are stringent controls; in effect, potent policing.

Insurance Has a Cost, Too

What Should We Do When Someone Needs Back-Up?

In recent columns we have been discussing the possibilities of using cost accounting to help improve the efficiency of using cost accounting techniques to improve and control the efficiency of a computer installation.

A basic technique has been to provide a valid profit center in the installation so as to create the capital resources needed to finance efficient operations. Three types of applications have been mentioned: Major applications (those which justified obtaining the computer); Minor applications (those which are added because the computer is available); and Make-Work applications (which are run although there may be no need for them, but to keep programmers and operators productive and not restless). This column suggests that there is actually a fourth type of product which an installation produces.

If an industry is to represent fairly how it is working – how much product it is making, how much capital it is using to its stockholders, it has to be able to identify just what the product is. And also against each product it must be able to show how much income this particular product contributed to the firm.

A computer installation is no different, except in degree, from an industry. It also should be able to identify its products. However, the problem is complicated by the fact that there may be products in a computer installation which have not been recognized as products.

The basic way that a product can be recognized is by the fact that it has both a cost and a value. If a cost is identified as occurring, and there appears to be no benefit derived from it directly then it is either overhead or it is actually an unrecognized product. As far as computers are concerned, the big unrecognized product that exists is insurance of performance.

If you open up almost any proposal for a computer you will find some phrases saying that while the system can run on six tape units, it has been recommended that seven be obtained so as to "provide for security," or perhaps there will be a recommendation for a back-up computer system.

If you go a little bit further you see that there quite possibly is either a managerial decision to buy additional capacity at this point in time, or alternatively there is doubt as to whether or not a smaller computer will be able to handle the job, and therefore a technical decision to purchase more then is apparently necessary. After all, the argument runs, we must still pay our employees at 5:30 on Thursday.

All these are recognized as expenses but what is not recognized is that they are also products. The product of having an additional tape unit in case one goes down is that the computer system is safer. And, as a product, it should be charged against who benefits. It is not an application-oriented product, nor is it a management-oriented product; management approves but gets no particular benefit from it. The people benefit, and the cost therefore should be charged to the computer department.

The Taylor Report

By Alan Taylor

The product of having additional capacity in case it becomes useful later is a management product. Management may not be thinking today of mergers but tomorrow a firm may come up and in a week's time you may suddenly have two more divisions.

Management may want to have the comfortable feeling as it goes into merger discussions where it can turn around and say, "Oh yes, our computer system can integrate your employees and your systems in with ours and we can be in operation next week."

It is a lovely, comfortable and profitable feeling to have. But it is a management advantage and is not related to the current applications. It should therefore be charged as a product of the department to management. (They will probably put it in general overhead, it seems to be the correct place for it, so that everyone pays for it. But that is another story!)

But the problem of the cost of back-up or redundant equipment is different. Items specifically procured so as to allow particular applications to be safeguarded, additional memory purchased in case inventory goes over the $520,000 mark, higher-graded processors obtained so that an application can be run twice during the night rather than just once (in case the operator makes a slip), etc. are costs incurred to insure on-time or in-capacity reliability of production of specific applications. These are application oriented and they should therefore be charged to the particular application.

Is this important? In many cases, yes. A back-up computer installation installed or a group of programmers employed to maintain an application are an insurance that can often cost 30% to 40% of the total cost of the installation!

The idea of running an efficient installation is to allow it to run profitably as a profit center. If application charges are allocated over all the users this means that higher costs are genuinely involved only with specific applications and will be charged to all. This will discourage the Minor Applications which are therefore overcharged because it means that the using department will not profit as much by the use of the computer as it might have done. As such it will not be motivated to use the computer as hard.

By contrast, the applications that demand these expensive facilities will not be paying particularly for that back-up. This will tend to make them demand even expensive insurance without regard to the actual financial implication. In fact, it means that the Minor applications will be subsidizing the Major ones – which is exactly the wrong way around!

Because of the size of the costs involved it is necessary to recognize that one of the products of the computer industry is its security in being able to continue to do the work. This must be taken into account and must be allocated, after being identified to the various items mentioned above.

Some part must be charged to management for general overhead, some part should be charged to the computer department itself for the technical overhead, and some part should be charged application by application to the user departments.

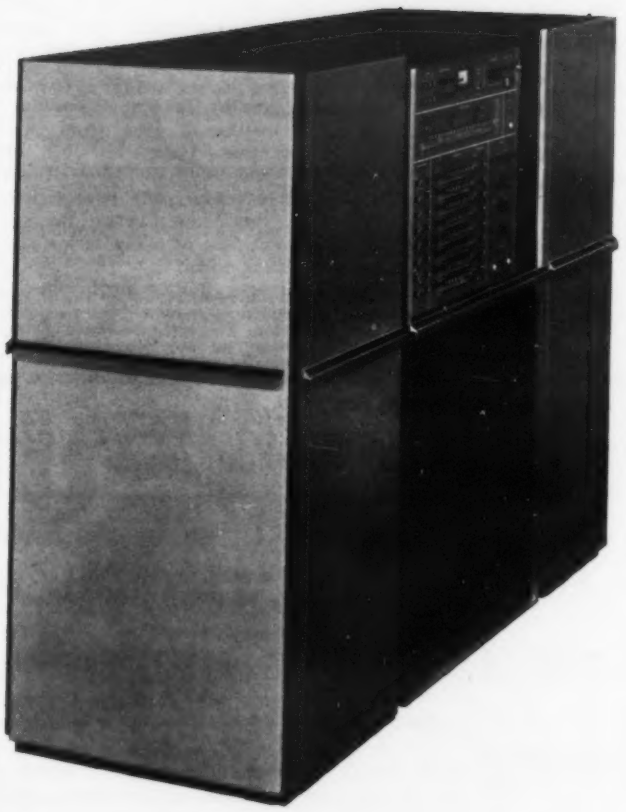
Again the decision as to what part each should bear is rarely a technical question, and technical data processing people should only be involved in identifying the size of the cake to be cut up and recommending on its distribution.

Management, and management alone, is capable of making the decisions in light of the circumstances and the current aims of the total organization if the aims of the department are to be kept in line with the aims of the organization.

Here again is the role that only management can play in keeping our computer systems efficient and making them even more efficient.

Here lies the answer as to how to prevent the cost of computing within a firm from skyrocketing – (like the cost of copying did in many firms when Xerox made it so simple to copy) – even when the apparent cost of computation was coming down.

What others claim, we do.



Ampex Extended Core Memory is busy at more than a dozen operating sites, doubling or tripling IBM 360 throughput. We're the only ones actually doing it on-line.

Our ECM has proved itself at such installations as universities, computer time-share services, a medical service center, governmental agencies and a number of major corporate EDP centers.

Ampex ECM at one university, using 360/65 Computer, has increased its computing speed 3.5 times over operation with the IBM 2361 LCS. Another user confirms that with the 360/50, Ampex ECM runs at 1.8 times the main core, far outstripping the LCS unit.

Our ECM has a cycle time of 4 or 2.8 microseconds, depending on the computer, expandable from 1 to 8 million bytes. It's a direct plug-in system to replace the IBM LCS with no software changes.

You can lease or buy, get direct Ampex installation and service from a worldwide organization of factory-trained personnel.

Call your Ampex representative for a list of operating sites. One call will be the ultimate guide to increasing your computer time efficiency. And you can ask about IBM plug interchangeable tape drives and other computer products from Ampex, the leader in computer peripherals—available individually or on an OEM basis. Call Ampex, (213) 836-5000, or write Computer Products Division, 9937 West Jefferson Boulevard, Culver City, California 90230.

Your computer counts on us.

AMPEX

Control System Allows Batch DOS Multiprogramming

HUNTINGTON, Conn. – Users of smaller-scale 360s can have concurrent telecommunications and batch-processing operations under DOS without heavy core requirements through the Display Control System (DCS) from Aids Associates Inc.

Although originally designed to support CRT terminals only, the logic of DCS is said to be flexible enough to allow the use of almost any type of terminal.

Aids said that DCS does not require IBM's Multiprogramming Support and is, in fact, best implemented under a batch-only DOS. The 500 bytes used by DCS fit easily into an 8K supervisor, the firm said.

No reserved partitions are used by DCS. Instead, all core beyond the supervisor can be used by the batch or the terminal application program. A series of "snapshots" of core are stored and retrieved from a disk library as control switches back and forth between the batch and the on-line processing.

The switching process takes less than a second, according to Aids. One user told CW that he had even faster switching times in his testing of the system.

Transparent

DCS is transparent to both the DOS supervisor and all problem programs. The system can support application programs written in either Cobol or BAL.

The company said that no reprogramming is necessary for implementation of DCS. The sample Cobol program provided by Aids does include linkage to and from DCS. Beyond that, the user needs no special language extensions or coding, except when working with sequential files.

DCS can function with non-sequential input files, but sequential files are not recommended because of the excessive amounts of time that would be required to retrieve records.

Problems would also occur if the terminal application programs attempt to write normal sequential files. Instead, DCS provides a special "capture" file on which data entered from any terminal and for any application is recorded sequentially, for later distribution to the separate application files.

DCS gains control of the CPU when an Enter key on a terminal is depressed, and the address of the interrupting terminal is posted to a queue. If batch processing is in progress, all pending I/O activity is "dried up" and a "snapshot" of core is written on disk. DCS then reads a message from the first terminal in the queue, to determine which application program should be called.

Control Retrieved

If there are no more terminal interrupts on queue, the batch processing "snapshot" is retrieved and control is returned to the batch processing program at the point where it was interrupted.

Commenting on DCS, one user called it "a real gold mine" and another noted that, with it, he not only would have had to get considerably more core than his current 32K, but he would have had to move into IBM's Btam to get support for his CRTs. He said that Btam would have forced him to switch over to BAL coding from the Cobol he preferred, and that in general, Btam was less useful.

The DCS package is priced at $15,000, including installation, documentation, education and support. Monthly rental plans are also available.

Aids Associates Inc. is at 30 Huntington Ave., here.

Polyphase Improves Processing Time, Program Overlay Control in DOS/360

By Don Leavitt

CW Staff Writer

SAN FRANCISCO – When storage limitations require the use of program overlays in a DOS/360 environment, users can "substantially" improve on processing time documented in IBM manuals with the Polyphase Overlay handler from Information Equities Inc. (IEI).

The key to Polyphase is a change in the Disk Fetch macro within the DOS supervisor. The change is required to capture the load address of each subprogram being called, from the Link Edit routine. The change increases the supervisor by six bytes, and does not affect operational programs in current use, according to the company.

IEI added that it sees the time improvement with Polyphase as significant enough to ask IBM to adopt this change for future DOS releases. IBM has not responded to this request formally, yet, but an IBM spokesman told CW that as a general rule: "We don't support any macros but our own."

In contrast to IBM's recommended technique, Polyphase is said to keep track of multiple subprograms in core. It is able to determine which, if any, subprograms are still usable, thus eliminating unnecessary fetches. On the other hand, Polyphase does permit fresh reloading of the subprogram at the user's request.

Background-Foreground

The Polyphase method is said to be usable in the background of a partitioned DOS environment, and in the foreground as well when the supervisor is generated with a Batched Job Foreground (BJF) option.

Polyphase does not require any logical changes in the problem programs. Rather it is based on a revised link editing of the subprograms, and on the ability to determine the extents of each subprogram in storage.

With both the Load and the End address of each subprogram available, Polyphase is able to note which, if any, of the programs previously loaded have been made unusable by a new fetch, and to flag the faulty programs on an internal table, the company said.

The Polyphase Overlay coding occupies 264 bytes in addition to the table of 20-byte entries for as many subprograms as the user wishes to control in core at any one time. IEI added, however, that the shorter the table, the less efficiency is gained by the Polyphase logic.

There is no limit, the company said, to the number of subprograms used which do not require simultaneous core residence. Nested calls, in which one subprogram calls another subprogram, can be handled through a single inclusion of Polyphase Overlay with the highest level root module.

The Polyphase Overlay handler is priced at $400 per installation and IEI said that delivery can be made 10 days after receipt of payment.

Information Equities Inc. is at 447 Battery St.

Informatics Adapts Mark IV to Spectra

CANOGA PARK, Calif. – RCA Spectra users will now be able to use the Mark IV File Management System. The Spectra version runs under TDOS and requires a minimum of 65K of main memory on a 70/35 or larger.

The system, offered by Informatics, Inc., is said to be indistinguishable in its results from the versions designed to run on the IBM 360 for which the system was originally developed. The user can use the same input on the Spectra as he did on the 360, merely by changing the job control instructions, the firm said.

The RCA version includes all of the capabilities of the original system. Additionally all optional special features of Mark IV unrelated to hardware can be added. The special features include table look-up, extended file processing, extended transaction processing, and text processing.

Users of the 360 version had previously reported programming time savings of 50% or more.

The Mark IV system was developed by Informatics for use with the 360 in a broad range of applications. It maintains files and produces reports without requiring complex computer languages such as Fortran and Cobol and thus does not require experienced programmers to make it work. The system was first installed in March 1968 and now over 300 installations are using it, Informatics said.

The Spectra version is currently in operation at four sites. It uses the full facilities of the RCA TDOS, with the exception of Isam (Indexed Sequential Access Method). Isam, however, will be implemented in the next release of the Spectra Mark IV scheduled for the fourth quarter of 1970, Informatics said.

Prices of the system are the same as for the 360 version. The basic system carries a price tag of $35,000. The optional features are: table look-up, $2,500; extended file processing, $5,000; extended transactions processing, $5,000; and text processing, $3,500.

Purchase price of the system includes customer training and necessary documentation. The policy that Informatics has established of providing users with the latest version of the system without additional charge will be continued.

Informatics is at 21050 Vanowen St.

'Des-Comp' Gives Computation, CAI Functions to User on RCC Network

LOS ANGELES – Socio-Economic Systems Inc. has developed a two-part time-sharing program that allows the user to shift between computational and computer assisted instruction (CAI) modes.

Known as Des-Comp, the program is available through the Remote Computer Corp. (RCC) network.

In the computational model, the user has access to arithmetic, algebraic and trigonometric operations.

Prepared courses provide review of the computational capabilities, but the user may also develop courses keyed to his own organization. He may return to the computational mode at will.

Des-Comp service is available for 13 cent/sec of CPU time, plus $2.60/min for I/O and a special $1.50/hr "elapsed time" charge in addition to RCC's standard $5/hr for connect time.

Remote Computing Corp. is at One Wilshire Blvd.

Bank Loan Monitor

CAMBRIDGE, Mass. – Instant Securities Control, Evaluation and Review Gauge (Iscerg), a financial time-shared control system which allows banks to monitor on a remote basis in real-time, collateralized loan accounts, has been developed by National Information Services.

Iscerg is designed to connect banks to the third party IBM 360/67 time-sharing computer housed in Interactive Data Corp.'s facility, in Waltham, Mass., by means of a computer terminal in the banks' premises.

The anticipated charge for the service is between $10 and $16 per year.

National Information Services is at 675 Massachusetts Ave.

Correction

An article in the Aug. 26 issue of CW about the Minicomputer Business Package (MCBP) from Computing Corp. International Inc. (CCI) should have listed the address of the firm as 3375 S. Bannock, Englewood, Colo.

Company Uses 'Cool' Approach to Cobol Conversions

SALT LAKE CITY – The capability to convert any computer language to any other is claimed by a software company here. Emphasis is placed on conversions from Autocoder, BAL, RPG, and assembly languages to Cobol.

Automated Industrial Data Systems, Inc. (Aids) has recently begun marketing its service, called ConServ, with the following features:

- A fixed price per statement to be converted will be quoted for any conversion effort, based on the number of statements to be converted and other conditions of the project.
- A period of time during which the conversion effort must be completed will be identified and guaranteed.
- The converted program is guaranteed to meet customer acceptance after debugging and program parallel testing. The customer will not be billed for the service until the program is accepted, the company said.

The program conversion techniques used include the evaluation of the logic flow of the program by a systems analyst, the program being considered a highly refined systems analysis. This evaluation is said to sharpen the program logic.

Cool Meta-Language

The analyst then reprograms the logic of the existing program using a proprietary meta-language, Conversion Oriented Optimized Language (Cool). The process of converting from the original language to Cool is said to be simplified by the structure of the Cool language. Cool enables the analyst to take advantage of features of the language into which the program is being converted and is also said to provide a reasonable amount of optimization.

The Cool program is then processed to generate the converted source deck on a Univac 1108. After debugging and parallel testing, final acceptance tests are run on the customer's computer or the equivalent.

Among Aids' customers for this service have been Standard Oil of California, First National Bank of Nevada in Reno, Marin County (Calif.), Kennecott Copper western operations, Burroughs, Univac, and CDC.

Aids claims a current conversion capability of 30,000 statements per month. This capability will soon be expanded by 50%, the company said. Conversion charges can range from 25 cent/statement to $1.25/statement, with the typical charge per statement ranging from 90 cents to $1.

Aids, Inc. (Automated Industrial Data Systems) is at 1059 E. Ninth South.

MMP Helps Churches Find 'Talent'

EDINA, Minn. – Church and synagogue leaders can make better use of the "time, talents and treasures" of the members with the Membership Master Profile (MMP) and Contribution Record Reporting System (CRRS), available from Tri-Data Systems.

According to Tri-Data, the packages are compatible and can be used jointly or separately. They are also available on a processing service basis, for churches that have no access to a computer.

Initially designed in cooperation with church business administrators, the systems are said to provide the flexibility needed to fit the requirements of congregations of any denomination and size.

Complete Data

MMP is said to include complete demographic, interest, activity and membership information about each individual member of the congregation. The system can provide either simple listings or complex cross-tabulations, thus enabling the pastor and lay leadership to better utilize the capabilities of members.

CRRS is designed to provide a more frequent and in-depth report to individual giving units, resulting in a net increase in income and an improved cash flow. Weekly proof sheets plus monthly stewardship reports, pledge summary reports, receipts breakdown, distribution of weekly contributions and contribution records to individual giving units are an integral part of the system.

Cobol-Oriented

Written in Cobol, Church CRRS/MMP will operate on any Cobol oriented machine, including the 360 or NCR Century series, with a minimum of 32K memory, three disk or four magnetic tape drives.

The packages are available for in-house use for $10,000 plus installation charges. Charges for processing on a service basis are subject to negotiation.

Tri-Data Systems is at 7301 Washington Ave. So.

UCC Edit/Fastext Updates, Prints Periodic Reports

DALLAS – Companies that produce large numbers of papers, reports, manuals and other documents that require periodic update, but whose basic format remains the same, can use the Edit/Fastext preparation system developed by and available through University Computing Co.'s Fasbac service.

The system, in effect, stores the basic material in a form that is accessible to the user on a per-line basis for correction, but which, once corrected, can be used to produce a finished editorial product. In this system, the finishing touches can include margin justification, a company source noted.

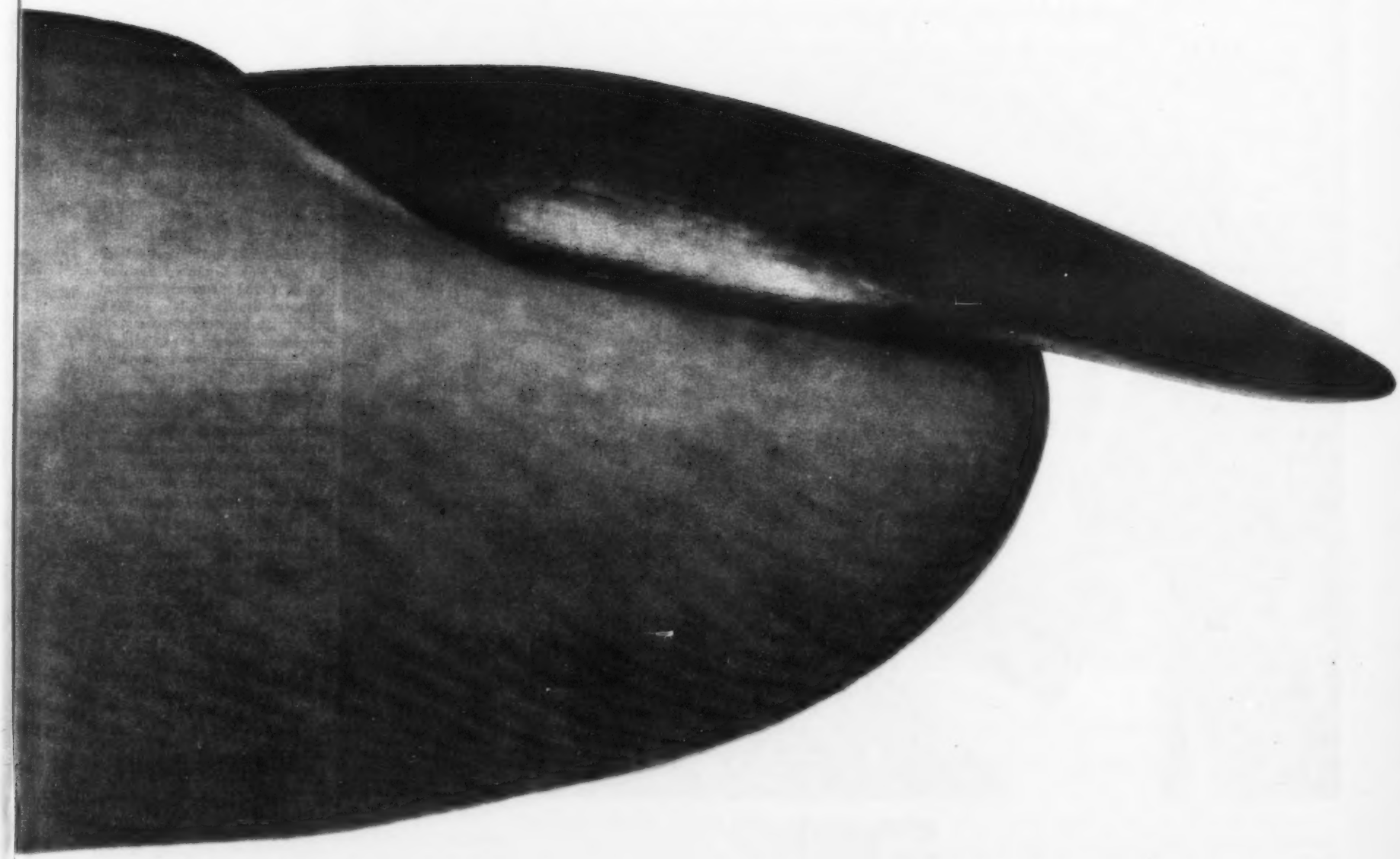
Improved Accuracy

By eliminating the manual retyping and re-proofreading, the system should provide improved accuracy and much greater speed, he added.

UCC said the Fasbac provides remote batch keyboard-speed access to a CPU. Cost of this service is $7.50/hr for connect-time and 25 cent/thousand characters per month for mass storage.

Charges are also made for what UCC calls Computer Resources Units but the company said that the maximum hourly charge for connect-time and CPU together would not exceed $16. There is no monthly minimum billing for Fasbac, but there is a $100 initiation fee.

University Computing Co. is at 1300 Frito-Lay Tower.



Remember that beautiful girl who thought key-punch was something you drank on Ben Franklin's birthday?

Call her back and hire her. She can be an operator on your new data entry system. Not just for decoration: We've invented a data entry system that's operator-proof. (So it's obviously not key-punch.) It's our ENTREX™ 480 system: with its own computer and disk, controlling up to 64 individual DATA/SCOPE™ CRT keystations. If the beautiful girl can manipulate a typewriter, she can enter data. And she can verify data on the DATA/SCOPE™. For her, it's about as difficult as watching tv. She can learn in two hours. And our system doesn't depend on her accuracy alone. The computer validates the input information, allows verification, searches for any record and displays 480 characters at a time. If she still gets into a jam, our exclusive "Help!" button gets her out of it. We made it fast to save time. We made it operator-proof to save money. Of course, these are things you'll figure out when you see it yourself. So write or phone ENTREX, Inc., 113 Hartwell Ave., Lexington, MA 02173. (617) 862-7230.

ENTREX

Data Line-Sharing Saves Users 50% on Transmission Charges

By Ronald A. Frank
CW Technical News Editor

LOS ANGELES – The sharing of data lines, a concept that can save computer data users up to 50% in line charges compared with normal one subscriber/line usage, is being offered by International Management Information Services Inc. (Imis) here, with a second firm, Timeplex Inc., planning to begin similar shared services early next year.

Based on recent modifications of AT&T's private line tariffs for 1000 and 3000 Series data services, Imis is currently offering its Multiplexed Data Transmission Service (MDT) to data users operating between New York, Los Angeles, San Francisco, and Honolulu.

Imis is primarily a communications consulting firm which maintains an in-house data network for its own use. The MDT services made available to outside data users are basically a sharing of surplus data lines, according to an Imis spokesman.

Under the MDT line-sharing service, Imis provides the data user with "sub-channels" from its network. All lines are conditioned to a C-4 level, according to a spokesman, to provide reliable transmission. The C-4 conditioning is currently the highest level offered by Bell.

The availability of shared lines from Imis is limited only by the user's ability to obtain local loop interconnection and data terminals from the local telephone company, he said. Non-Bell terminals can also be used by subscribers.

Under the MDT plan the user is billed by the local phone company for local facilities while Imis bills for the interstate facilities used. The user does receive a verification of the total line charges from AT&T to check on the amount which he pays to Imis. The firm in turn pays AT&T the total charges for its shared lines. As part of the MDT service the data user is provided with modems and multiplexers from Imis.

Communications

Current charges for service from New York to Los Angeles is $575/mo without local loop charges. An Imis spokesman told CW that this rate is about 50% lower than AT&T single user private line rates. Data rates up to 150 bit/sec are available from New York to the West Coast with1,200 bit/sec transmission available from San Francisco to Honolulu.

Another Form

A similar line-sharing service between New York and Washington is being planned for next January by Timeplex Inc., a manufacturer of computer communications equipment.

A Timeplex spokesman told CW that the firm uses the link primarily for sales demonstrations and other in-house uses and that surplus facilities will be offered on a share basis to computer data users.

Under the Timeplex line-sharing plan, data privacy for each user of the joint service would be assured, the spokesman said.

According to Timeplex, the planned line sharing will allow firms to establish communications links at rates not previously possible under non-shared tariffs.

International Management Information Services Inc. is at 550 S. Vermont Ave., Los Angeles.

Timeplex is at 1522 K St. N.W., Washington, D.C.

Modem Handles 1,200 Bit/Sec

FORT WASHINGTON, Pa. – A Bell 202C-compatible data set from Tele-Dynamics provides asynchronous digital transmission at rates up to 1,200 bit/sec over voice-grade lines.

Called the 7104, the unit can be configured for full-duplex operation on four-wire lines, or half-duplex operation on two-wire lines. Turnaround time on half-duplex operations is 120 msec.

The price of the 7104 ranges from $200 to $400, depending on configuration.

The Tele-Dynamics Division of Ambac Industries is at 525 Virginia Drive.

Inquiry Display System Is 360-Compatible

SAN ANTONIO – A data inquiry and display system, comprising a controller and up to 64 local or widely dispersed CRT terminals, from Computer Terminal Corp., is fully compatible with the IBM 360 line.

The lease or purchase price of the system is approximately half the cost of other systems, according to the maker. The exact figure depends upon the number leased and auxiliary equipment required. Installation costs and cable requirements are termed inexpensive since the cables carry only data and not video, the firm said.

The Datapoint 3360 is said to be completely compatible and interchangeable with the IBM 2260/65 terminal systems. According to research conducted by Computer Terminal, several thousand IBM terminals of this type, at an average monthly rental of $180, are currently in use.

Downtime on the system is said to be wholly eliminated by the controller's unique dual redundancy. Clear, flicker-free characters are said to be achieved by a local refresh rate of each display 60 times per minute instead of the 48 times per minute typical of most terminals. The units each can display 24 lines of 80 characters.

The 3360 terminals operate at 2,400 bit/sec for local service or 1,200 bit/sec for remote service through Bell 201B or 202C data sets. Remote interface of a Datapoint 3360 controller with an IBM 360 system is provided by one or more IBM 2701 data channels, depending upon data flow requirements.

Installation of a controller adjacent to a computer requires only a channel adapter for direct connection to the IBM 360 multiplexer channel.

Two models of the 3360 terminal are available. The 3360 transmits a line of 80 characters at a time. The Model 3360A can transmit the contents of the screen (a page of 1,920 characters) at one time.

The 3360 controller software system provides channel management with flexible display format, editing, automatic features, error control and code and format conversion for use with optional peripheral equipment. Custom features of this type can be installed, the company said, without any changes in existing 360 system software.

The price of the 3360 controller is $680/mo. The purchase price is $18,650 with maintenance costing $115/mo on a purchased system. Lease prices of the 3360 and 3360A terminals are $83/mo and $94/mo respectively, while the purchase cost is $2,540 for the 3360 and $3,600 for the 3360A. Maintenance costs are $13/mo to $15/mo, depending on the model.

An auxiliary printer that can print out the contents of the screen at 30 char/sec can be leased for $100/mo or purchased for $3,600. Maintenance on the printer adds $33/mo to the cost of the purchased system.

Computer Terminal Corp. is at 9725 Data Point Drive.

Tennecomp Systems Tape Cartridge Unit Is First Plug-to-Plug PDP-11 Accessory

OAK RIDGE, Tenn. – Claimed to be the first plug-to-plug compatible peripheral for the DEC PDP-11, a tape cartridge unit from Tennecomp Systems, Inc. is compatible with the computer's Unibus construction.

The basic TP-1351 had been available previously for the PDP-8 and other minicomputers. It provides mass storage capabilities for the PDP-11 at low cost, offering capacities up to 256K words stored on each cartridge.

Four-Track Tape

Data is recorded on a continuous loop of 1/4 in. magnetic tape, bit serially on each track, with a track selected by a manual switch. Tape lengths available vary from 5 ft with a capacity of 4K words, to 248 ft with a capacity of 256K words. Intermediate cartridge sizes of 16 ft and 62 ft are also available.

A write enable pin is used to prevent accidental loss of data. The beginning of tape sensor uses an optical system that detects a reflective marker.

Recording Density

The recording density is 500 bit/in. with a tape speed of 7-1/2 in./sec, resulting in a transfer rate of 3,700 bit/sec. Start time and stop time are 400 msec and 200 msec, respectively.

The TP-1351 comes completely assembled, according to the manufacturer, and is said to be easily installed. Two screws are used to secure the tape controller inside the computer cabinet, and power and signal interconnections are provided by a Unibus jumper.

The TP-1351 is immediately available at a price of $2,600 which includes the transport, interface and software.

Tennecomp Systems, Inc. is at 795 Oak Ridge Turnpike.

Educational Computer Allows Circuit Study

BERKELEY HEIGHTS, N.J. – A computer designed exclusively for educational use has been developed by Feedback Inc. from its original EC360/370 machine.

The Abacus is said to parallel realistically current computer design in circuits and operational capability. However, several differences between Abacus and conventional commercial computers are said to strengthen its educational capability.

Physically larger than most minicomputers, the Abacus can incorporate detailed mimic diagrams and illuminated displays in its front panel. This is said to enable students to follow visually data flow and instruction manipulation through all computer operations.

The internal circuitry of the computer is readily accessible for student investigation. Circuits are all TTL modules and are said to be laid out so that a student can follow signals through the machine. The tracing of signals in a commercial machine is very difficult due to circuit "tricks" used to reduce component requirements, the company said.

The Abacus can be controlled manually or automatically. In the manual mode, the student performs the functions normally carried out by the control unit.

Under automatic control, the Abacus can be operated at slow or fast speed. At slow speed, the students are able to follow the operation from the front panel displays.

The Abacus consists of two units: the arithmetic unit, or central processor, which can be operated separately to demonstrate CPU functions; and the control unit and core store.

The Abacus is a single address machine with parallel control and serial arithmetic. The memory has a capacity of 512 16-bit words, word addressable. The instruction repertoire consists of 32 instructions with modifiers. A Teletype ASR 33 can be attached as an I/O device.

The price of the complete Abacus is $8,900. Bought separately the processor and control cost $3,300 and $6,300 respectively.

Feedback Inc. is at 438 Springfield Ave.

Varian Adds Four Disk Drives to 620; Gives More Random Access Flexibility

IRVINE, Calif. – Varian Data Machines has expanded the family of disk memories for its 620 computer product line with four additional units. The low-cost disk drives are said to enhance the external storage devices available with Varian's 16-bit processors.

The units with storage capacities ranging from 30,000 to 585,000 words are said to lower significantly the costs of automated data processing and provide economical bulk data storage for the 620 family.

Any of the disks coupled with a 620/i or 620/f computer, according to Varian, are complemented with Varian's disk operating system, Master Operating System, (MOS) to bring the features of a large disk system with batch processing to the small system user.

All four units will be available with third quarter computer deliveries, the company said.

The Model 38A, fixed head disk, priced at $6,800, includes controller and provides storage expansion of 30,000 words. The new disk drive is said to give rapid access with its head-per-track construction and transfers data at a 73.3 kHz word rate in an automatic block transfer mode using a 620 Direct Memory Access.

The 16-track device has a 1,775 rpm spindle rotation for an average latency time of 17 msec, and utilizes flying-head construction with electronic switching.

Increased Capacities

Increased capacities to 61,000 and 123,000 words are provided by Models 38B and 38C, respectively. Access time and transfer rates are the same as those of Model 38A. Model 38B, a 32 track version, is priced at $7,600. Model 38C, with 64 tracks, sells for $10,000.

A higher capacity capability is offered with the Model 39 moving head disk for $9,900, including controller. Storage is 585,000 words on the removable disk pack device, which can be expanded with the addition of a slave for a total capacity of 1,170,000 words. The slave is priced at $5,600.

Spindle rotation is 1,500 rpm for an average latency time on a given track of 20 msec. Data is transferred in an automatic DMA mode at 42 kHz. Typical "seek" time is 160 msec on the aluminum disk, which is coated on both sides with magnetic oxide and mounted inside a protective cartridge. The disk pack is compatible with IBM 2315 specifications, the firm said.

The two disk pack system includes simultaneous read/write and "seek" capabilities. This feature, Varian said, significantly increases system efficiency by permitting the user to transfer data to or from one disk while seeking another track on the second disk. A highlight of both disks is their File Protect which, when activated, prevents any data from being destroyed or altered.

Varian Data Machines is at 2722 Michelson Drive.


Jaffee

Slow entry?

It takes a lot of peanuts to feed a big input bound central processor.

That's why Inforex developed Intelligent Key Entry.™

Inforex feeds hungry CPU's. It does electronically what other forms of data entry do mechanically.

The Inforex system gathers data from eight keyboards into one disc memory unit. Data may be sight or key verified. Built-in logic performs check digits, left-zeros and balance totalling. Jobs are pooled onto 7 or 9-track compatible tape. Optionally, it will operate on-line directly to your central processor.

Keypunch/verifier functions. Starting with the familiar 64-character keyboard, each Inforex keystation performs all keypunch and verifier functions: Automatic check-digit computation. Automatic left zeros. No digit by digit keying is necessary. Electronic skipping and duplicating rather than mechanical. Auxiliary duplication or two additional levels of program control. Automatic + or − signing of fields.

Simultaneous entry and verification. All eight keystations input to one disc memory unit. Each keystation is assigned an area as it enters. Any keystation can access any assigned area at any time. Since each keystation has both sight and key verification capability, one keystation can verify work entered on another and if desired, verification can be done simultaneously with data entry.

Keyboard to tape functions. Inforex automatically pools input from up to eight keystations onto 7 or 9-track compatible tape. One easily entered statement transfers a series of batches. Only one keystation is required to initiate the transfer, and all keystations are functional during transfer. There are no cartridges to handle or identify, no special equipment needed for pooling.

Recallable programs. Each program has four levels of control. Once the program is keyed, it can be stored for future use and recalled by any operator merely by keying its appropriate program name. Up to 128 different program controls can be stored. There's no program card or tape mounting and no repetitive program control keying.

Self-balancing. Zero balancing is an integral part of the Inforex system. Each operator may accumulate a control total during data entry. Edit controls allow rapid correction. Adjustments to the balance total occur automatically during verification.

125-character records. With Inforex Intelligent Key Entry, the record length is variable up to 125 characters.

Full record display. For added accuracy, each keystation displays an entire 125-character record with moving cursor and position counter. The system has a forms capability that allows data entry and verification in a "fill-in-the-blank" fashion. Operator messages for direct interaction with the system along with search and paging of a file are standard.

Attractive office decor. Inforex design innovation doesn't stop with the components. Each Inforex keystation is built into an attractive contemporary walnut and black steel desk designed for operator ease and comfort. And remember, the system is electronic, not mechanical, allowing a quiet, comfortable atmosphere to work in.

Inforex monthly rental cost is $50 per keystation. $560 for control unit (up to 8 keystations). $960 for a complete 8 keystation system, including maintenance.

Inforex, Inc., 21 North Avenue, Burlington, Mass. 01803 or, Inforex AG, Dornacherstrasse 210, Basel, Switzerland.

"Inforex it."

Keypunch Replacements—Part III

Poolers Keep Key-to-Tape Units Small, Easy to Use

By H. Edward White
Special to Computerworld

Most keypunch installations have several operators working on one application. When the computer is run, the cards are fed into a hopper. When computer tape is recorded directly by key-to-tape systems, a "pooling" operation is required to place the data from many operators onto one tape.

It we have to go through a separate step in order to make efficient use of key-to-tape, would there be an advantage in recording onto a non-computer-compatible tape, and "pool" onto computer tape?

Six manufacturers think so: Cybercom, Data Action, IBM, Sycor, Ty-Data, and Viatron.

What are the advantages?

The notable ones are: a smaller machine, elimination of tape handling, greater selection of longer record lengths, and simplified operating procedures. Lower unit cost was among the original goals, but only Ty-Data and Viatron offer machines below the cost of compatible tape systems.

IBM Inscriber

The first unit to come along was the IBM 50 Inscriber. It offers eight programs (instead of the usual two), and a completely variable record length of up to 720 characters. An English instruction describing the field to be keyed (typed on the program drum card) appears on the operator's console. The last character entered is displayed in a matrix with table look-up (much like Honeywell).

Cartridges (which hold the equivalent of about 300 punched cards) are "hopper fed" directly into the computer by means of the Model 2495 on-line reader. The data transfer rate is about the same as an 800 card/min reader if your cards only have about 60 columns punched (faster if fewer columns).

The system completely eliminates "pooling." The price for a 10-machine installation would average about 15% higher than compatible systems, which would very likely involve "pooling."

Off-Line 'Pooler'

About one year later, Data Action decided to offer virtually the same machine, but with a character display (facsimile keyboard), and an off-line "pooler." The customer may use the IBM on-line reader if desired, with Data Action recorders. Data Action prices are about the same as compatible systems (about 15% below IBM).

Cybercom can give you an 80- or 200-character record. Programs are loaded from a card which can be punched with a stylus, and has operating instructions written on it. The proper instruction is indicated by a guide light. There is an actual character display (not keyboard facsimile), and a set of "corrective action" instructions which are illuminated when an error occurs. It's a good one to look at if you plan to use unskilled operators. Price (including "pooler") is about 15% over compatible systems.

There are two CRT systems in the group: Sycor and Viatron. Each can display operator instructions in addition to data recorded for the entire record. Much has been written about Viatron; Sycor's machine is quite similar. Sycor solves the "pooling" problem by offering a unit with a computer tape drive attached.

At the present time, Viatron is punching cards, but plans to offer computer tape at a later time. Sycor's prices are about the same as Cybercom and IBM.

During the past two years over 30 companies have developed keyboard-type data recording devices designed to replace keypunch equipment. Apparently these companies believe that many of the estimated 400,000 keypunch and verify devices installed in this country will be replaced by their equipment.

But how valuable are these new devices to the keypunch user? Are they cost effective? Do they increase efficiency?

In this series CW explores the advantages and disadvantages of the keypunch replacement devices.

Ty-Data (except for Viatron) offers the lowest unit prices in the group, about 30% below compatible systems. If you have a large number of machines, and accept the need for "pooling," they are worth careful study. They have an actual character display, variable record length of up to 240 characters, and stored programming from a tape library.

All of the units have error correction like the compatible systems, based on backspacing. Tape handling couldn't be much easier – just "snap in" a cartridge or cassette. The manufacturers in this group have paid more attention to operator controls, guides, and displays than in the compatible group. They are designed to be easier for a non-keypunch operator to learn to use.

Any disadvantages? Yes. Except for IBM and Data Action, you'll have to buy a stand – they are all "desk-top" units.

All of the compatible systems offer read-after-write check, but only Cybercom and Sycor have it in this group. While the "pooler" will pick up recording errors, the procedure to re-enter an erroneously written record can be awkward – be sure you understand what it is.

Of course you must "pool," and if the "pooler" is down, you cannot feed the computer (the same can be said for a keypunch system when the card reader is down).

Another group of manufacturers saw all of this tape handling just to get the data on a single reel of computer compatible tape: they said, "Why not 'hardwire' the keyboards directly to a single tape?"

They did, and we'll talk about the "automatic pooling" group next week.

H. Edward White has been an independent data processing consultant for the past seven years. He has had extensive experience with data recording and communications equipment, and is currently manager for corporate planning at I/O Com Inc.

DP Test May Pinpoint Deficient Employee Training

By Harvey Elman
CW Staff Writer

LEXINGTON, Mass. – A newly developed DP training test allows a firm to ascertain the objective industry knowledge of an applicant and to strengthen deficient areas of employee training.

The test further indicates a 98% correlation between the test scores, supervisory evaluation, and the employee's personal evaluation.

Aimed primarily at 360 OS Cobol programmers, "Plan II" contains questions covering the following technical areas: Introduction to S/360, Cobol, BAL, Job Control Language (JCL), OS Concepts, File Organization, Advanced Programming Techniques, and Teleprocessing.

Plan II, consisting of 150 multiple choice questions, was developed for Raytheon by Oyer Professional Computer Services, New York, under the direction of Joseph Surkis. Twelve Raytheon programmers chosen at random and two Keane Associates senior programmers participated in the test.

Need for Training

Raytheon's Dave Cutler, IPS administration manager, feels the test determines the need for specific types of training and is not to be used as an indication of how well a programmer performs. "This survey, however, can only test knowledge of rules and logic," he stressed, "and does not measure application of this knowledge in a job environment."

In the test, an associate programmer relatively fresh from school scored higher then senior programmers who were more involved with program systems logic than coding conventions in their daily tasks.

Surkis evaluated the results of the several months-long test and will tell Raytheon which course modules are needed for each individual. Recommendations are based on the desired course.

Education

"The cost is about $30 for each person taking the survey. That's a lot less than hiring somebody and being forced to fire him in 90 days," noted Surkis. "We have designed the survey in modules, and we go over each of the training questions with the training people and the DP managers. That way we're certain what they really want so that we don't give them irrelevant information," he said.

Four Areas

Four areas for which each participant had at least a working knowledge were selected for correlation of test scores to supervisor's evaluation. These areas were: Introduction to S/360, Cobol, JCL, and File Organization.

"This test isn't a hatchet, it's an *aid* to develop the individual and to plan our future training procedures," stressed Charles Purrelli, director of MIS for Raytheon.

By combining the supervisor's evaluation, the employee's personal evaluation, and the test results, Raytheon hopes to pinpoint deficient training areas. "Spot sampling will enable us to test the test," said Purrelli.

Raytheon is currently conducting a similar test of all computer DP personnel.

Education Service Network Opened

MINNEAPOLIS – An education service center offering computer-based administrative and instructional aid to schools has been opened by Honeywell here.

The first center will serve initially more than 50 Minnesota elementary schools, high schools and colleges. Additional centers are planned nationwide.

Honeywell cited the following purposes and advantages of the education network:

- Access to a proven, time-shared computer system (Honeywell 1648) utilizing extended Basic, Fortran IV, Solve, Teach and Edit languages plus an individualized math program and an extensive subroutine library totally dedicated to computer-based instruction. This service is called the Education Instruction Network (Edinet).
- Access to an operational on-line administrative system covering pupil, staff, financial and property accounting. All administrative tasks and concerns of staff, programming and operation of the computer are handled by Honeywell. The service is known as Administrative Network Service. (Adinet).
- Access to resource specialists thoroughly familiar with computer-based instruction technology and school administration.
- A full-time staff of professional education consultants to provide in-service education and workshop sessions to assist teachers in planning practical approaches to computer-based curriculum.
- Complete sharing of programs developed at the education service center.

"The Honeywell full-network-service approach is designed to overcome two major obstacles hindering the wider adoption of computer-based instruction," said Robert F. Trocchi, manager of the Educational Resource Center in the firm's Information Services Division.

"These obstacles are the apparent lack of instructional materials, and limited teacher-training facilities," Trocchi said. "Edinet, for one, attempts to solve these by providing an exclusive network of academic users sharing validated curricula at considerably reduced costs."

St. Peter's Receives Grant

JERSEY CITY, N.J. – St Peter's College has received a $22,494 grant from the New Jersey Department of Community Affairs to conduct a data processing program for municipal employees.

The project is part of the state Community Development Training Program of the Department of Community Affairs. It is funded by appropriations from the State of New Jersey and a grant from the U.S. Department of Housing and Urban Development under Title VIII of the Housing Act of 1964.

Students Program in Class

BOWLING GREEN, Ohio – Students preparing for careers in computer science or business "experiment" in class at Bowling Green State University.

Using IBM 2741 communications terminals linked to a 360/50, undergraduates write their own programs and solve complex problems in quantitative terms as part of two major fields of study at the university. These courses are computer science and information systems.

Canadian Computer Show To Cover T/S Legalities

MONTREAL – Legal aspects of time-sharing will come under scrutiny at a two-day conference in conjunction with the first annual Canadian Computer Show at Montreal's Place Bonaventure, Sept. 14-16.

Among questions to be studied during one conference session are contracts between data center and user, third-party liability arising from data use and government regulations on data transmission and storage.

The session will discuss liability of a data center for lost or damaged files, penalties for noncompliance with terms of the contract, proprietary rights relating to software, and liability for defamation of character arising from the use of stored data.

The show, sponsored by the Canadian Information Processing Society (Cips), will feature exhibits ranging from large computers and DP equipment to minis, peripherals, software, continuous forms, tapes and ribbons, data binders, keypunch services, index, filing and storage equipment, consulting and contract programmers and time-sharing.

5,000 Attendees

Approximately 5,000 attendees are expected to view the exhibits and demonstrations of more than 150 companies.

The conference, which has been organized by the show's advisory council representing various industry associations, will devote five separate sessions to exploring the theme "Shared Use of Computers through Communications – Potential, Growth, and Control."

Another session will emphasize management awareness of possible time-sharing problems; solutions will be proposed.

Societies

Among subjects discussed will be controls to ensure receipt and proper processing of all valid data, rejection of invalid data and maintenance of the validity of previously processed data. Controls to ensure that only authorized persons handle data and the possibility of data being obtained by wiretapping will also be discussed.

"Computers, Communications and Government" is the theme of the final session. Under discussion will be areas of concern to government and how government copes with these problem areas, i.e. the Telecommission approach. Future government attempts to facilitate the use of computers and communications will also be studied.

ISA New Afips Affiliate

MONTVALE, N.J. – The Instrument Society of America (ISA), Pittsburgh, has joined the American Federation of Information Processing Societies (Afips) as an affiliate society.

The scope of ISA activities includes the theory, design, manufacture and use of instruments and embraces the science and technology of measurement, information acquisition, telemetry, data processing and display, automatic control, measurement standards, metrology, analysis, and systems engineering.

Its activities include creating forums, disseminating information, providing educational opportunities and materials, developing standards and practices, and recognizing individual technological achievement.

In the area of data processing, the society maintains formal divisions within its technology department covering data handling and computation; and telemetry.

Industry Standardization Is Aim Of Comtec, New COM Users Group

HAWTHORNE, Calif. – A step toward the establishment of national COM (computer output microfilm) standards was taken recently with the launching of Computer Micrographics Technology (Comtec), a multi-manufacturer COM users group dedicated to creating industry standards, equipment evaluation, and providing industry interface on software.

John V. Erck, a charter member, stated: "The new bylaws insure majority control for users. The chairman and vice-president must be users, and the treasurer must be a manufacturer.

"The remaining directors are divided between users and manufacturers. Membership is free to all COM users but only one voting member may represent an organization."

The new group is an outgrowth of a clash between COM manufacturers organizing their individual user groups. A common meeting ground is now provided for all manufacturers and users.

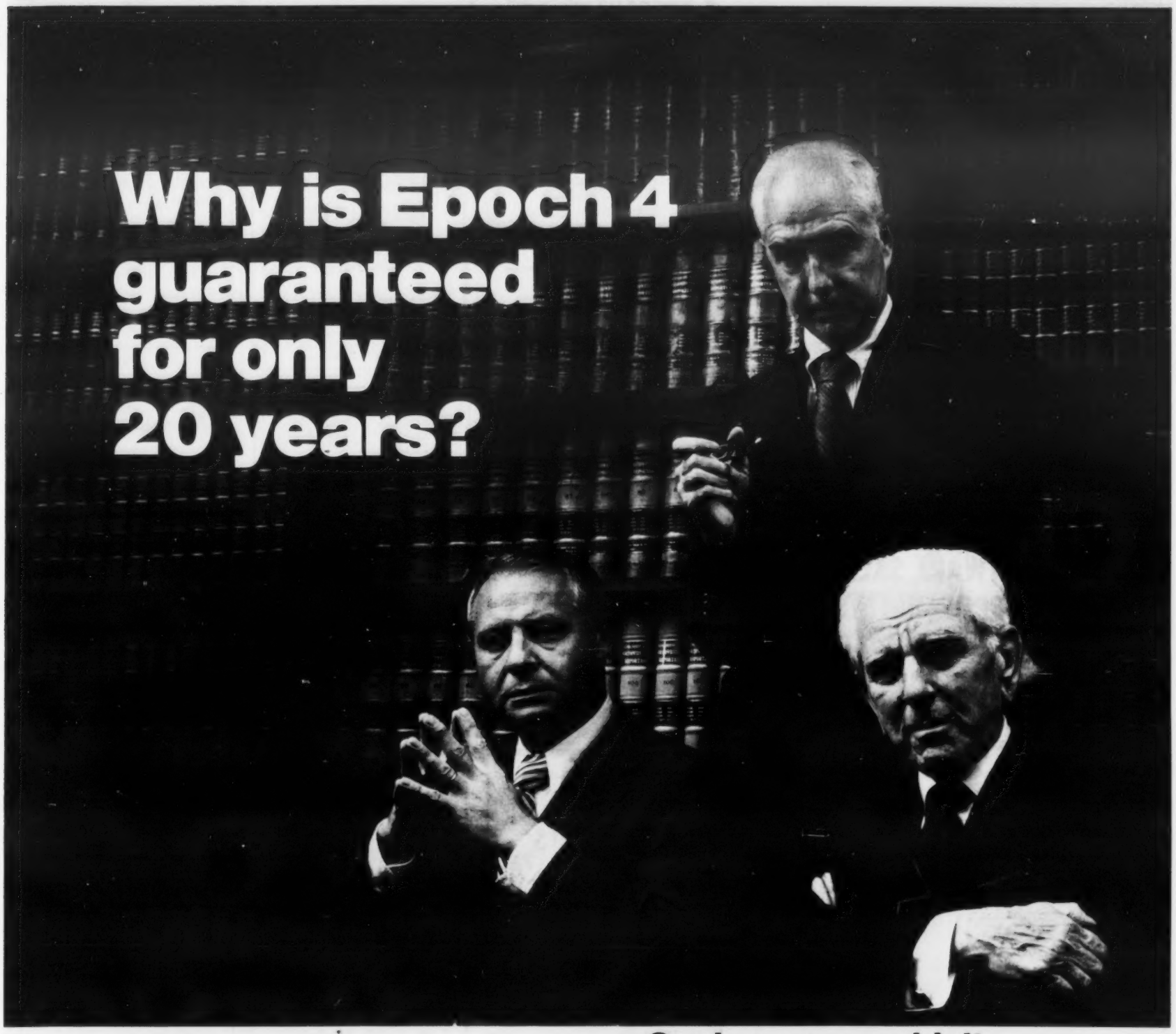
The first Comtec board meeting was held in Los Angeles last month. A general meeting is planned for January 1971. The chairman is Virgil DeVine of XDS.

Calendar

Sept. 15-16, Washington, D.C. – 4th Annual Instrumentation Fair. Contact: Norm Ward, Ad-Tech, P.O. Box 475, McLean, Va. 22101.

Sept. 16-18, Seattle, Wash. – Annual meeting of the National Association for State Information Systems (Nasis). Contact: Diane Jordan, Council of State Governments, Iron Works Pike, Lexington, Ky. 40505.

Sept. 21-24, New Orleans – Meeting of the Honeywell Users Group (Hug) with the theme "Software." Contact: Charles Douglas, Tenneco Corp. Houston, Texas.



Our lawyers wouldn't let us say "forever."

We figure a 20-year warranty will make our point, even if we can't legally say "forever." *Epoch 4's new coating is so tough, so flexible and resilient, that it withstands the kind of handling that would instantly kill a conventional computer tape.*

Put another way, Epoch 4's new coating is 8000% tougher than the best competitive products on the market.

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September 9, 1970

Carterfone Calls NAS Carrier Study on Tariff Biased

By Alan Drattell
CW Washington Bureau

WASHINGTON, D.C. – Carterfone Communications Corp. last week told the Federal Communications Commission that the public is the loser when new products and communications systems are delayed by "unending and time-consuming discussions."

Carterfone also recommended that the study of a special panel of the National Academy of Sciences (NAS) be rejected by the FCC.

The company's comments resulted from an FCC request earlier this summer for responses by interested parties to an NAS study called "Report of a Technical Analysis of Common Carrier/User Interconnections." The study has been commissioned by the FCC to aid the agency in evaluating questions raised by revised tariffs.

These tariffs had been filed by telephone companies in response to commission orders stemming from the two-year-old landmark Carterfone Decision, which allowed for interconnection of non-Bell devices to the transmission system.

Other Responses

In addition to Carterfone Communications, other responses received by the FCC include those from IBM and the Electronic Industries Association plus a handful from smaller data transmission companies. The FCC noted that other filings were filtering in and that a study of the responses would take "several months."

Meanwhile, Carterfone Communications in its comments took umbrage at the NAS report which it described as "misdirected, biased and erroneous. The report is biased in favor of the telephone companies," Carterfone said.

"It is appalling," the company continued, "that the economic survival of substantial segments of the communications industry and the public's right to benefit from new products and communications systems should depend upon unending and time-consuming discussions which are, regrettably, the hallmark of the communications industry.

"The panel's proposal fits perfectly with the overall strategy of the Bell system: to delay as long as possible the widespread connection of customer-provided equipment in order to increase the competitive advantage of the telephone companies and to permit competitors from private industry to die out as a result of increasing financial losses.

'Comfort and Aid'

"The panel only gives comfort and aid to the telephone carriers by suggesting that the carriers' excuses for interminable delays in complying with the Carterfone Decision have some validity."

Carterfone stated that on the basis of the conclusions reached by NAS "it is apparent that the panel members were singly inclined to believe whatever they were told by the telephone company representatives."

The principal technical findings of NAS were:

- "Uncontrolled interconnection to the common carrier network as it now exists would be harmful.
- "The requirements of the tariff criteria limiting characteristics of interconnected lines are technically based and in accord with the operational limits of the common carrier network as it now exists.
- "The nature of potential harm, criteria for protection against such harm and the performance of various components of the telephone system can be specified explicitly enough to be understood and acted upon properly by people with normal technical competencies."

The panel also studied protective measures and suggested two approaches: "protective arrangements as required by the tariffs; and a properly authorized program of standardization and properly enforced certification of equipment, installation and maintenance."

Carterfone, in addition to recommending rejection of the NAS report, suggested "a simplified and interim equipment certification procedure be promptly adopted.

"This procedure should be effective and enforced for at least a two-year period in order to give immediate release to members of the communications industry who seek to market quality products in competition with the Bell system."

Carterfone also recommended that "the telephone companies should be ordered to amend their tariffs in order to accommodate the interim certification procedure. This will require that the tariff provisions requiring data access arrangements and voice connecting arrangements for certified equipment be eliminated."

Further, "to the extent any access arrangements are required for either voice or data transmission, then such equipment should not contain transformer circuits which accomplish dc isolation when such arrangements are used with customer-provided equipment which does not utilize an independent power supply.

"Likewise, such connecting arrangements and access arrangements should not contain other unnecessary features which give the Bell sytem a competitive superiority.

"The telephone companies should be ordered to cease from attempting to enforce any tariff provisions requiring a connecting arrangement or access arrangement for the direct electrical connection of customer-provided equipment when such connecting arrangement or access arrangement has not yet been designed and manufactured in reasonable quality by the carrier or is not available on reasonable delivery dates to the customers requesting such arrangements."

IBM Comments

IBM, in its comments signed by Nicholas DeB. Katzenbach, vice-president and general counsel, said: "Our interest in interconnection of user-provided data transmitting and receiving equipment to carrier networks is to obtain the opportunity to make more effective use of data processing in conjunction with communication systems."

The manufacturer supported "the currently authorized approach of carrier-provided protective devices (interconnecting arrangements) and adherence to tariff-specified signal criteria," and IBM agreed that "the option of direct user interconnection should also be available."

Navy Awards 3-Year Lease Contracts For Tape, Disk Drives to 5 Companies

CW Washington Bureau

ARLINGTON, Va. – The Department of the Navy's Automatic Data Processing Equipment Selection Office here has awarded three-year lease contracts for plug-to-plug compatible tape and disk drives to five major peripheral manufacturers. The awards, totaling $15,866,276, are believed to be the largest computer peripheral contracts ever made by a federal agency or a private company.

The equipment will replace IBM's 729 and 2400 series tape drives and 2311 and 2314 disk drives and is expected to save the Navy at least $8 million over the life of the contracts.

Provision for add-ons to the contracts of up to 60% will increase the savings accordingly.

The five companies awarded were California Computer Products Inc. (Calcomp) for disk drive memory systems, $4,443,595; Potter Instrument Co., Inc., tape and disk drives, $5,811,635; Ampex Corp., tape drives, $1,334,088; Memorex Inc., disk drives, $3,669,480; and Telex, tape drives, $607,478.

The equipment will be installed at Navy computer installations across the country.

'Prototype'

The awards follow closely Navy "prototype" procurements of plug-to-plug compatible gear in December to Potter and last July to Ampex and Calcomp. These three contracts are expected to save the U.S. $925,000.

A spokesman for the department said that it is "important we're saving money, but at the same time there is no degradation of system performance whatsoever."

The Air Force has a similar award for plug-to-plug compatibles pending, but a spokesman at L.G. Hanscom Field in Bedford, Mass., said that he could not estimate when announcements of the award would come.

Currently, some pending AF computer procurements are undergoing scrutiny as part of the Department of Defense's review of its operations.

The General Services Administration also said that it will issue a request for proposal in about three weeks for replacement of IBM tape and disk drives. There was no indication of the number of pieces of equipment to be involved in the procurement.

The Navy awards and the pending AF and GSA contracts are in line with the Federal Government's current search for cost-cutting techniques in its overall data processing operation. The Office of Management and Budget, formerly the Bureau of the Budget, last February in Bulletin 70-9 directed that federal agencies take a look at their installed inventory of leased plug-to-plug compatible equipment and determine whether or not they could be replaced by devices from peripheral makers.

Federal Government Sees Decline In Number of Computers in 1971

CW Washington Bureau

WASHINGTON – The long arm of the government's spending cutback has reached even the sacrosanct area of computers. For the first time since it began keeping official count of the number of computers installed in the federal establishment nearly 12 years ago, the government forecasts a decline in installations for fiscal year 1971.

Although the total rose sharply in fiscal 1970 (ending June 30), to 5,277, from 1969's 4,666, the estimate for fiscal 1971 is 5,234. This is admittedly a miniscule drop on a year-to-year basis, but it's never happened before. In addition, it is particularly significant because the yearly increases since 1959 have usually averaged approximately 20%.

In its new "Inventory of Automatic Data Processing Equipment in The United States Government" released last week, the General Service Administration's tabulations show IBM still leading the pack in number of machines installed, but unlike the general marketplace where it completely dominates the filed, its lead in federal installations is marginal.

IBM has 1,397 units in place, with Univac a close second with 1,014. Following, in order, are Digital Equipment Corp., 499; Control Data Corp., 404; NCR, 321; Honeywell, 299; XDX, 229; Burroughs, 204; RCA, 184.

The Air Force continued to be the largest single user, with 1,210 followed by the Army with 927, and the Navy with 894. The Atomic Energy Commission accounted for 754, and Nasa 692. The Defense Supply Agency had 125 and the Department of Transportation, 118.

Other major users included the Health, Education and Welfare Department, 96; National Science Foundation, 18, and the Labor Department, 10.

The Office of Economic Opportunity had three units installed. All other civilian agencies combined accounted for 387 and other Defense Department agencies 43.

The ratio of systems purchased vs. leased rose for the third year in a row. Of the 5,277 installed in fiscal '70, 3,372 (63.9%) were purchased and 1,905 (36.1%) on lease. In 1969, 2,790 (59.8%) were purchased and 1,876 (40.2%) leased.

Hopes for Wimmix Plan Revived

By Michael H. Blake Jr.
CW Washington Bureau

WASHINGTON – Death notices on the proposed acquisition of a large quantity of computers for the Worldwide Military Command and Control System (Wimmix) may have been premature [CW, Aug. 26].

The planned procurement of a minimum of 15 standardized computers with an option for 20 more, which has been banging around various government and military agencies for the last couple of years, may surface yet, sources here said.

The General Accounting Office (GAO) has been reviewing the project at the direction of the House Appropriations Committee, it was learned last week, and the final draft of the GAO report is nearly ready to go to the committee. Informed Washington sources report that GAO will give the revised Wimmix procurement plan the go-ahead.

The other major delay on the project, an evaluation of the program in light of the recent report by the blue ribbon defense panel (Fitzhugh Group), was expected to be cleared up by the end of last week, with no major problems foreseen in this area either.

New OEM Products

Potter Shows Pulse Transformers

INGLEWOOD, Calif. – A line of pulse transformers designed for application with core memory systems is available in both conventional and dual-in-line package configurations from The Potter Co.

The units range in inductance from 10 μH to 100 mH and have turn ratios from 1:1 to 10:1 with up to four windings.

The prices for the units range from 50 cents each to $1 each in production quantities depending on type. Delivery is said to be approximately four weeks.

The firm is at 500 W. Florence Ave.

Raymond Recorder Bows

MIDDLETON, Conn. – A digital cassette recorder, the Raycorder Model 6406-01 from Raymond Engineering Inc., contains complete logic level interface electronics for control of the transport at DTL/TTL lines.

Designed for data acquisition; keyboard entry, and data storage, the unit operates with standard or improved Philips type cassettes and measures 5.5 in. by 5.6 in. by 2.6 in.

Data is serial phase encoded on input and output and the firm claims that read/write speed is maintained by a bi-directional motor drive with high-speed rewind to either end of the tape.

Raymond Engineering Inc. is at 217 Smith St.

Varian Unveils Recorder Series

WALNUT CREEK, Calif. – Varian Aerograph has introduced the Series G-2500 Strip Chart Recorders featuring a push-button digital chart drive system to provide 20 resettable chart speeds from 1 in./hr to 1,000 in./hr or 0.01 in./min to 10 in./min.

The unit also employs an electric pen lift, 10 ranges from 1 mV to 1V, 0.5 sec pen response, 0.15% accuracy, horizontal platen with 10 in. chart width and single or dual channel operation, according to the firm.

Prices start at $1,025 and delivery is 20 to 30 days.

The firm is located at 2700 Mitchell Drive.

Nixie Tube Display Module Announced by DEC

MAYNARD, Mass. – The immediate availability of a Nixie tube display electronic circuit module that provides a "convenient method of building decimal displays" has been announced by DEC.

The unit, called the K415, is a double height module that may be used in a DEC K943 mounting panel with or without the DEC K950 panel hardware. All pin connections are made on the "B" connector half of the module. The K415 is plugged into every other connector socket for multi-digit displays.

Unit price is $46.

Iodisc Series 1000 Data Storage System

Disk Drives Have Detection System For Head Crash

SANTA CLARA, Calif. – A series of OEM disk drives from Iomec that are plug-to-plug compatible with a variety of minicomputers features a head-crash detection system.

The Iodisc Series 1000 data storage systems can plug into most popular minis. These include: Hewlett-Packard HP2114B and 2116; DEC PDP-8/I, PDP-8/L and PDP-12; Data General Nova and Supernova; Micro Systems 810 and 812; and General Automation 18/30 and SPC-12.

Storage capacities for other minicomputers are available in 120 to 180 days. Avery F. Blake Jr., Iomec marketing vice-president, said that the Iodisc systems can be attached to almost any small computer because of the capabilities of the Iodisc controller.

Head-crash detection is provided by a position air filtration system that detects concentration of particles in the vicinity of the read/write heads. "Iomec has never experienced a head crash, either during testing or in customer use," according to a company spokesman. The air filtration system is also said to eliminate environmental contamination and maintain positive pressure in the drive enclosure.

The Series 1000 disks are available with either fixed disks, disk cartridges, or both. When both fixed and movable disks are installed, they are served by the same moving actuator which carries one head for each surface of the disk. This design approach provides, on a single drive, the capability to interchange data between the removable cartridge and the fixed disk.

While using the removable cartridge for the input and output of data, the fixed disk can be used for the copying of data and also on-line storage of programs and data.

The Series 1000 comprises five models of various disk configurations ranging in storage capacity from 22 to 88 Mbit. The Model 1011 is equipped with one cartridge, the Model 1012 with one fixed disk and one cartridge, mounted on one drive.

The Model 1022 uses two cartridges; Model 1023, two cartridges and one fixed disk; and the Model 1024 has two cartridges as well as two fixed disks.

The average access time for the cartridge-only drives is 60 msec, while those with fixed disks have an average time of 70 msec. A bit density of 1080 bit/in. on the innermost track combines with a 1,500 rpm rotational speed to produce a data transfer rate of 720K bit/sec.

The unit quantity prices for the various models are: Model 1011, $13,900; 1012, $15,600; Model 1022, $19,900; Model 1023, $22,700; and the Model 1024, $24,350.

All models are currently available on a 20 to 60 day schedule.

Iomec, Inc. is at 345 Mathew St.

Government Meeting Sees Interface Standardization

MYRTLE BEACH, S.C. – If the "competitive interest of the computer industry can be resolved to the benefit of the user community," then I/O interface standardization has a good chance to proceed.

A National Bureau of Standards spokesman has indicated that, if the users and manufacturers can resolve inherent differences, then the standardization would probably be accomplished at the American National Standards Institute (Ansi) level.

The viewpoint was expressed during a computer systems management conference here. Sponsored by the federal Office of Management and Budget, the conclave concluded with the belief that the development of interface standards is technically feasible.

The General Services Administration (GSA) reported little vendor interest in a project to design a computer system from components provided by various suppliers. The plan will be pushed anyway, GSA said, and "assuming satisfactory responses" in the near future, the agency hopes to award a contract by the end of October.

Conferees heard GSA, the official government purchasing agent, praise the idea of using plug-to-plug compatible peripherals, noting that the government could save $6 million in annual leases if the independent-supplier concept continues.

GSA added that users of such compatible peripherals are reporting satisfactory performance and considerable savings.

A number of alternatives could be pursued to reduce the cost of currently leased peripherals for which independent plug-to-plug compatible equipment is not available.

These include the following:

- Purchase of the currently leased devices, taking advantage of accrued rental credits.
- Soliciting proposals for replacement of selected peripherals, giving the option to the potential supplier for bidding equipment that is directly plug-to-plug compatible or capable of being interconnected through an adaptor device furnished by the supplier.
- Developing, in-house or by contract, a "black box" adaptor.

Meeting participants also discussed benchmarks as an evaluation technique particularly for large, multiple system procurements.

It was suggested that greater use might be made of in-house technical evaluations, including the use of simulation packages, for small procurements.

The conferees also looked at purchase vs. long-term lease of capital equipment and concluded that adequate guidelines are lacking for determining residual values of hardware.

Software Customer(s)?

Regarding software, there was an underlying question of whether the U.S. can be regarded as a single purchaser of programs or whether agencies are to be treated as individual purchasers. Current regulations do not require agencies, in all cases, to get GSA approval of procurements. It was recommended that a specified dollar value be put on software purchases requiring GSA approval.

Consideration was also given to the proposition that software packages acquired for government use "ought to be supplied in standard languages in order to promote their utility and reduce their cost to the government."

In the case of licensed program products, instituted by IBM with unbundling, the government says that its interests, and those of other large users, "argue for the use of standard languages to facilitate the use of the product across a wider range of equipment models."

The government also wants to opt for contractual provisions that it get source language statements and program maintenance documentation in the event the vendor becomes unwilling or unable to maintain the program. This issue, it was agreed, should be considered further by GSA in contractual negotiations for fiscal 1972.

Cybermation Modular Interfaces Suited For Creating Data Acquisition Systems

WASHINGTON CROSSING, Pa. – A series of modular interfaces for use in creating low-cost, electronic, digital data acquisition systems has been developed by Cybermation Inc.

The subsystem, designated the Data Gathering System 30, is designed to provide the interfacing necessary for collecting, conditioning and recording data in computer-compatible format.

Applications include batch data collection was well as real-time entry of data to in-house or time-shared computers.

A key component of the System 30 is the Format Translator, which provides conversion of field signals into Ascii serial-coded format. Input to the device is a BCD signal from digital instruments, or through an A-D converter from analog instruments.

The Format Translator is capable of converting up to 16 BCD character blocks to an 8-level Ascii code, continuously and automatically. The translator is field adjustable to any BCD signal through plug-in ROM elements used to control output code, according to Cybermation. Input format may also be field altered through a field connector.

Audio Translator

The second component of the system is an Audio Translator which is responsible for conversion of Ascii data signals to audio range FM form. This feature allows the use of low-cost audio devices such as plug-in cassette units when recording data.

The translator functions as both a record and playback converter and may be configured to receive data signals directly from the translator, paper tape, or teleprinter keyboard, the company said. The start-stop operation of the recorder is activated by the FSK carrier from the translator.

The third unit is a Time Code Generator – a digital clock and special character generator/encoder. It permits appending of automatic or on-demand time/date information to data messages, by issuing machine-readable sequential signals into the data acquisition loop.

The clock portion of the generator provides for hours, minutes and seconds measurements, and includes a front panel visual display.

In the standard configuration, the three interfaces are packaged on three standard 19-in. rack mounting panels, each requiring 5-1/4-in. of panel height and 10-in. behind the panel space. Other packaging is available on special order. All components of the system are said to incorporate the following environmental operating characteristics: 0°C to 60°C ambient temperature at up to 95% relative humidity. Power requirements are 115 Vac, ±8%; 47 Hz to 63 Hz. The collective weight of the system is about 15 lb.

The price of the Format Translator is $1,000, the Audio Converter is $500, and the Time Code Generator is $400, in unit quantities. Quantity discounts, up to 40% for quantities of 100, are available.

Cybermation Inc. is at River Road.

Rockwell Microelectronics Enters Memory Race With Modular Units

LOS ANGELES – The newly formed North American Rockwell Microelectronics Co. has entered the memory business with the recent announcement of a new series of MOS/LSI modular memory systems with capacities of up to 65,536 words by 1, 2, 3 and sequentially through 40 bits.

The units are available in read/write, read-only or RAM/ROM combination memories and are mounted on standard plug-in circuit boards that include clock drivers, decoders, and interface circuitry.

The completely sequential bit-length availability and a 512-word base permit the design of memory systems with word-bit capacities customized to match equipment characteristics, a spokesman for the firm said.

The firm also said that MOS/LSI memory device circuits, systems layouts and board configurations have been computerized, which will enable it to customize rapidly to the particular memory requirements and equipment configurations of customers.

Typical specification for the new Memos-I circuits are said to be: cycle time as low as 750 nsec; access time of 500 nsec; I/O interface either TTL/DTL compatible or custom designed; operating temperature of 0°C to 70°C; and power consumption that is typically .25mW/bit.

Because of the wide range of options, no prices have been released for the units, but a company spokesman said: "Obviously we intend to be more than competitive."

SST Prototype Memory Awarded

HAWTHORNE, Calif. – An order for prototype memory systems for the digital control autopilot for the SST Supersonic Aircraft has been awarded to Electronic Memories here by the Sperry Rand Flight Systems Division, Phoenix, Ariz.

The specific amount of the contract was not disclosed.

"The preproduction contract consists of several modified Sems 6 Severe Environment core memory systems," EM President Richard J. Dadamo said. "The modification consists primarily of special interfacing and repackaging for the application."

"Delivery of the first system is scheduled for Dec. 1, 1970, and the total order must be completed by the latter part of 1971," Dadamo declared.

The integrated digital flight control system being developed by Sperry Rand's Flight Systems Division for Boeing's supersonic transport will automate many of the flight crew's functions and provide extensive self-testing and in-flight monitoring.

Hughes Data Display

OCEANSIDE, Calif. – A compact alphanumeric data display, designed to provide data equipment manufacturers with a low-cost way of incorporating video readout of digital information, has been introduced by Hughes Display Systems.

The new unit displays digital data input on a TV monitor with local character generation and refresh memory. Character capacities of 128, 256, or 512 characters are available.

Prices begin under $760 per display on 1,000-piece quantities. The company is at 2020 Oceanside Ave.

• If our new alphanumeric digital printer didn't work, neither would thousands of Friden calculators.

But of course Friden* calculators do work. Including the thousands of electronic printing models we've sold for the past 4 years.

With this ad, we're introducing 30-character and 40-character alphanumeric printers, both of which work exactly the same as the standard Friden 20-character model. A little wheel zips across the tape, printing up to 28 columns at 46 characters per second, inking itself on a roller made of solid ink.

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And if you'd like complete information on all three Friden digital printers, ask Mr. Gary Dotzler, Sales Manager, OEM Products, Friden Division, The Singer Company, San Leandro, California 94577.

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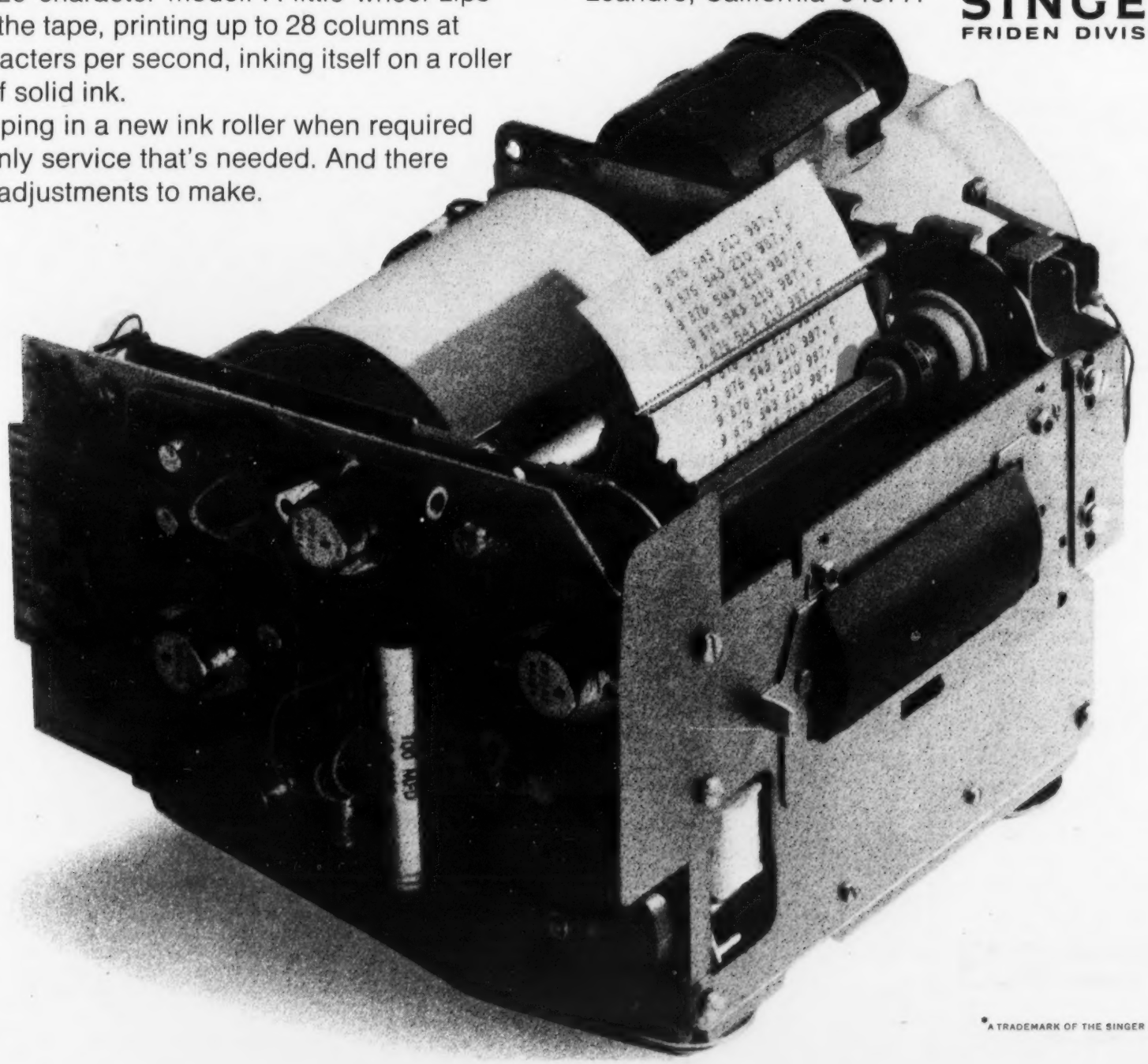

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DPF&G Big Loser

Bresnahan, Lectro and Dearborn Show Lease Gains

While a number of medium-sized leasing companies are reporting mixed interim figures, the biggest independent lessor of them all, Data Processing Financial and General Corp. (DPF&G), has substantiated its predictions of major year-end losses.

DPF&G's net loss for the year ended May 31 was $4.3 million, and added to that figure were a $4.8 million income loss from discontinued systems division operations and an extraordinary charge of $6.6 million.

Finance

Last year DPF&G reported an $8.2 million profit.

Showing profits, though are Bresnahan Computer Corp., Lectro Computer Leasing Corp. and Dearborn Computer & Marine Corp.

For the first nine months of fiscal 1970, ended June 30, Bresnahan Computer Corp., Chicago, disclosed earnings of $375,000 or 19 cents a share, compared to $254,000, or 17 cents a share last year.

Third quarter earnings, however, were off $55,000 from 1969 marks. William J. Bresnahan, president, gave the reason as "a very soft software market."

Revenue for the nine months was $4,480,000, well up from 1969's $2,076,000, and third quarter revenues totalled $1,499,000, up from $872,000 in 1969.

Third quarter earnings were $50,000, down from $105,000 in 1969.

New York-based Lectro Computer Leasing Corp. reported six-month figures for the period ended June 30 showing revenues up to $670,744 from $362,006 for the year earlier period, and net earnings up to $109,000 from $69,186.

On a per share basis, fully diluted, earnings for the 1970 six months were 21 cents, compared to 20 cents for 1969.

And if it weren't for a multi-million dollar write-off, the picture would be cheery at Dearborn Computer and Marine.

The nine-month period revenues jumped from $18.6 million to $26.2 million, while after-tax income from continuing operations increased slightly from $2.6 million to $2.86 million. Due to extraordinary losses in its oil business and the closing of its computer education division, though, Dearborn came up with a $1.58 million loss in 1970, compared to a $2.1 million profit in 1969.

On a fully diluted basis, the nine months earnings per share were $1.62 in 1969 and a loss of $1.02 in 1970.

For the third quarter revenues rose from $6.4 million to $9.2 million, but income from continuing operations decreased to $988,000 from $1.02 million. Fully diluted per share earnings for the quarter were 60 cents in 1970 and 32 cents in 1969.

Systems Engineering Agrees to Acquire Multidata, to Satisfy Debt Obligations

FORT LAUDERDALE – Systems Engineering Laboratories, Inc., and Multidata, Inc., a California-based manufacturer of small, "virtual memory" computers, have agreed in principle to an acquisition by Systems of all of Multidata's common stock.

The agreement calls for Systems to acquire Multidata for approximately 17,500 shares of Systems stock and to satisfy certain Multidata debt obligations.

Programming Ease

Over the past two years, Multidata has developed and just begun to manufacture the first virtual memory minicomputer systems, aimed at low-cost processing and ease in programming.

According to S.P. Eglash, president of Systems, and B.L. Chancellor, president of Multidata, "The agreement would expand Systems capabilities to new market areas not associated with the company's traditional real-time business while Multidata would obtain the support of Systems marketing, customer service, manufacturing, and financial organizations. Low-cost virtual memory computer systems are used where information is required on-time but not in real-time. Applications range from message switching in a communications environment to gathering and processing large amounts of information in universities."

Definitive Agreement

The agreement in principle is subject to preparation of a definitive agreement for approval by the boards of directors of both companies and by the Multidata shareholders.

It was also reported that Multidata plans to use the fixed head disks of Computer Peripherals Corp. (CPC), another pending Systems acquisition.

Formal Agreement

CPC Shareholders as well as both boards have approved a formal agreement whereby Systems will acquire the business and assets of CPC for approximately 122,000 shares of common stock.

Subject to certain conditions, a systems spokesman said, if the market value of these shares in August or September 1971 is not at least $5,484,510 ($45 per share), Systems will issue up to an additional 61,000 shares. Systems expects to complete the acquisition of CPC, which is in San Diego, by the end of the year.

Viatron Cuts Back Work Force by 135

BEDFORD, Mass. – At the beginning of 1970 Viatron Computer Systems and its subsidiaries were employers of almost 1,000 people; the number now is 365.

The newest layoffs at the terminal maker leave only 265 people working at the company's main Bedford facilities. The cutback involved 135, almost all at Bedford, who constituted 27% of Viatron's payroll, and 34% of the Bedford staff.

In All Departments

The layoffs were in all departments, according to a Viatron spokesman, except for assembly which had been cut back previously.

The spokesman also noted that Viatron will continue production as well as sell from inventory.

The move was intended to reduce costs, according to C.S. Morrill, a vice-president of the firm.

'Talking to Many'

Morrill declined to comment on the possibility of Viatron's merging with another firm, prefering to say, "We are talking to many people about many things." He did reveal, however, that Viatron's working capital has not decreased since last quarter.

The vice-president also denied the rumor that Viatron had to cut back because it couldn't meet its Sept. 15 payroll.

This layoff is the fourth in the last four months for the beleaguered company.

Astrodata Adopts Three-Step Plan To Bolster Sagging Earnings, Sales

ANAHEIM, Calif. – Slumping earnings and sales have forced Astrodata Inc., a maker of analog-hybrid computers, towards restructuring the organization along "highly centralized" lines.

R.B. Baker, president of Astrodata, indicated that while the company has undertaken a three-step program to bolster revenues and sales, there is no real assurance that it will break even in 1970. Baker said the number of Astrodata employees has been cut to 500 from 1,200.

Speaking at the company's annual meeting recently, Baker announced "a redirection of marketing aims," whereby Astrodata will "now make certain we exploit those areas in which we've paid the price of admission."

Astrodata reported a loss of $882,000 in the first quarter, ended June 26. This deficit was attributed by Baker to the market introduction of a new data sorter and new control systems.

For the year ended march 27, the company reported a loss of $3.6 million on sales of $17.5 million, compared with earnings of $89,000 on sales of $21.9 million in fiscal 1969.

Again, the Astrodata president ascribed the loss partly to costs of introducing new products, partly to unprofitable computer line operations, and the loss of a major communications contract.

Three Washington Area DP Firms To Form Delta Automated Systems

WASHINGTON, D.C. – Three metropolitan Washington computer firms have agreed to merge their operations into a new company, Delta Automated Systems, Inc., which will begin formal operations Oct. 1, 1970.

Merging into the new organization to be headquartered in Kensignton, Md., are: Delta Data Systems, Inc., engaged in proprietary computer software and management services; National Institutes of Computer Professions, Inc., which operates a data center and computer programmer school; and Computer Marketing Industries, Inc., which specializes in computerized direct mail marketing.

The terms of the merger call for CMI stockholders to receive one share of Delta Automated Systems for each CMI share, for a total of 274,005 shares; stockholders of Delta Data Systems will receive 246,000 shares; stockholders of NICP will receive for each share of NICP two-ninths of one share of Delta Automated Systems, for a total of 150,000 shares.

Dataram Shows Profit

PRINCETON, N.J. – In its second year of operation, Dataram Corp., a maker of memory cores and test equipment, turned in a profit of $84,214.

Resulting from net sales of $2,119,024 and other income listed at $4,557, the net earnings for fiscal 1970, ended April 30, contrast sharply to a net loss of $299,386, incurred during the company's first year of operation in 1969.

SEL, On-Line Systems Show Big Profits in Fiscal '70

In the face of a darkening economy, a few companies still manage to show a little financial sunshine.

Two such firms, Systems Engineering Laboratories, Inc., (SEL) Ft. Lauderdale, Fla., and On-Line Systems, Inc., a Pittsburgh time-sharing house, reported record-high and substantial gains, respectively, for fiscal year 1970.

Systems hiked its consolidated revenues to $21,153,000, compared to $17,298,000 a year earlier. Earnings for the year ended June 26 were $1,873,000 or 82 cents a share, compared to $1,453,000 or 70 cents a share in 1969.

The jumps represented increases in revenues of 22% and net income of 29% over previous year figures, while average shares outstanding rose from 2,072,000 a year ago to 2,294,000 on June 26.

S.P. Eglash, Systems president, said the record-high financial results were achieved despite slow economic conditions and delays in computer buying decisions experienced during the fourth quarter.

A Significant Year

Eglash called fiscal 1970 "a year of considerable significance" as Systems expanded marketing and support operations while introducing and establishing acceptance of several new products – such as the Systems 86/88 family of medium-sized computers and Keytran, a computer-based data entry system.

"In addition," he pointed out, "the sale of 250,000 shares of common stock last fall provided an additional $9.4 million in capital and should exclude any need for equity financing during the current year."

Eglash also said new order activity indicated even greater revenues and profits for fiscal 1971.

On-Line Revenues Up

On-Line Systems, Inc. also bettered its total revenues and net income, to the tune of $1,588,418 and $218,146. These figures compare with previous 12-month totals of $473,669 in revenues and an earnings loss of $191,531 in fiscal 1969.

John T. Godfrey, president, attributed the gains to increased use of services by existing customers in addition to many new customers.

Godfrey said other revenues and income in fiscal 1970 resulted from the sale of a communications controller, developed to his firm's specifications by a hardware manufacturer, and associated system software developed by On-Line Systems Inc. personnel.

"Another important step toward future growth," he said, "was the agreement reached with Dynabank Corp., which provides computerized business systems services to several large and small correspondent banks. Under this agreement, Dynabank will use its own proprietary software and our time-sharing services."

Godfrey said the project is expected to be fully operative by late 1970.

He also cited an agreement made earlier this year with Davis Computer Systems, (DCS) Inc. of New York, under which On-Line Systems would supply time-sharing services for DCS customers in the New York City area. "This business," Godfrey noted, "was subsequently acquired by On-Line, enabling us to expand substantially our marketing and customer support activities."

Under the agreement, he said, On-Line Systems continues to offer customers the use of a library of proprietary programs developed by Davis.

On-Line Systems' financial picture appears even rosier, according to Godfrey, due to increased marketing efforts and plans to place a third computer system in operation in the near future.

TRADE*QUOTES

Computerworld Stock Trading Summary

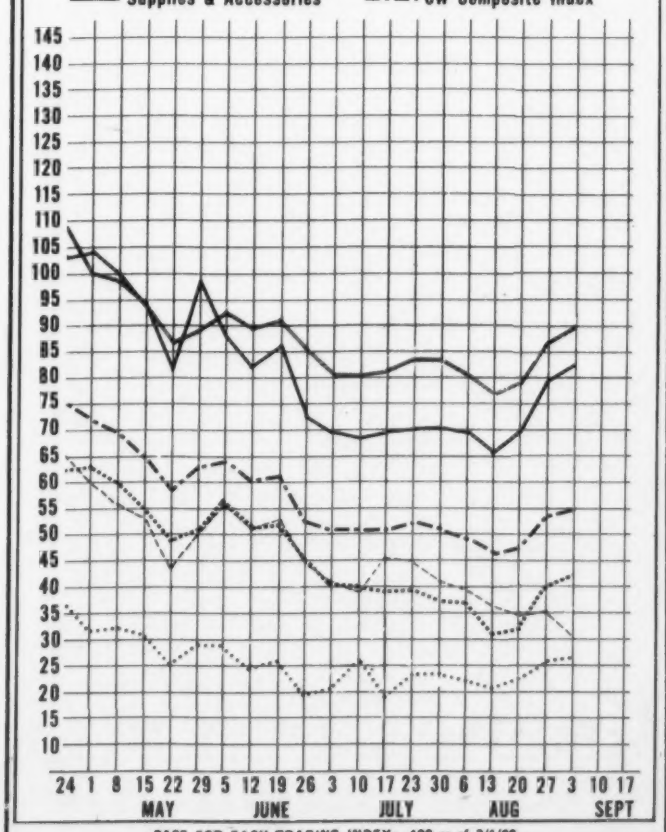
All statistics compiled, computed and formatted by TRADE*QUOTES Division of National Information Services, Inc. Cambridge, Mass. 02139

CLOSING PRICES THURSDAY, SEPTEMBER 3, 1970

EXCH		1970 RANGE (1)	CLOSE SEP 03 1970	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 6	3 1/2	+2	+133.3
A	APPLIED DATA RES.	4- 24	6 1/4	+ 3/4	+13.6
O	APPLIED LOGIC	2- 19	3	+1 1/4	+71.4
O	ARIES	1- 8	1 1/4	- 1/8	-9.0
A	AUTOMATIC DATA PROC	23- 47	35 7/8	+1 7/8	+5.5
O	AUTO SCIENCES	3- 14	4	+ 1/2	+14.2
O	BRANDON APPLIED SYS	1- 9	1	0	0.0
O	COMPUTER AGE INDUS.	1- 3	1 1/4	+ 3/8	+42.8
A	COMPUTER APPL	2- 12	2 3/8	- 1/4	-9.5
O	COMPUTER ENVIRON	3- 14	2 7/8	- 1/8	-4.1
O	COMPUTER INDUS.	2- 10	4	0	0.0
O	COMPUTER NETWORK	3- 14	8	+ 1/2	+6.6
O	COMPUTER PROPERTY	5- 15	5 3/4	- 1/4	-4.1
N	COMPUTER SCIENCES	6- 34	9 1/8	+1 3/8	+17.7
O	COMPUTER USAGE	2- 8	2 1/2	0	0.0
A	COMPUTING & SOFTWARE	4- 75	23 3/4	+1 1/4	+5.6
O	COMRESS	2- 10	2	- 1/4	-11.1
O	COMSHARE	3- 15	3	0	0.0
O	CONSOL. ANAL. CENT.	1- 3	3/4	- 3/8	-33.3
O	DATA AUTOMATION	1- 24	2 1/4	- 7/8	-28.0
O	DATA PACKAGING	5- 29	8	+1 1/2	+23.0
O	DATAMATION SERVICE	1- 6	1 5/8	+ 1/4	+18.1
O	DATATAB	5- 9	4 7/8	+ 1/8	+2.6
O	DIGITEK	2- 5	1 3/4	- 1/4	-12.5
O	EDP RESOURCES	5- 13	6	+ 1/4	+4.3
A	ELECT COMP PROG	3- 11	3 1/2	0	0.0
O	ELECTRONIC DATA SYS.	31-161	48 1/2	-1	-2.0
O	INFORMATICS	4- 21	6	- 3/8	-5.8
A	ITEL	6- 26	10 3/8	+ 1/2	+5.0
O	LEVIN-TOWNSEND SERV.	1- 13	4 1/2	+1	+28.5
A	MANAGEMENT DATA	8- 25	10	+ 1/4	+2.5
O	NAT COMP ANALYSTS	1- 8	3 3/8	+2 1/8	+170.0
O	NAT.COMP. SERV.	3- 12	4 3/4	0	0.0
N	PLANNING RESEARCH	13- 54	20	+1	+5.2
O	PROGRAMMING METHODS	9- 27	13	+3	+30.0
O	PROGRAMMING & SYS	2- 5	2 7/8	+ 5/8	+27.7
O	PROGRAMMING SCIENCES	2- 33	2 1/8	0	0.0
N	SCIENTIFIC RESOURCES	2- 22	3 3/8	+ 1/4	+8.0
O	SOFTWARE SYSTEMS	1- 2	3/4	0	0.0
O	TBS COMPUTER CENTERS	6- 27	6	- 1/2	-7.6
O	UNITED DATA CENTER	2- 4	2 1/2	0	0.0
N	UNIVERSITY COMPUTING	14- 99	19	+1 1/4	+7.0
A	URS SYSTEMS	5- 21	6 3/4	+1 5/8	+31.7
O	U.S. TIME SHARING	3- 14	3 1/2	+ 1/4	+7.6
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	21- 62	32 3/8	+2 3/8	+7.9
O	ALPHANUMERIC	2- 15	3 1/8	- 1/8	-3.8
N	AMPEX CORP	13- 48	16 5/8	+ 1/2	+3.1
A	ASTRODATA	4- 34	4 3/4	- 1/8	-2.5
O	BOLT,BERANEK & NEW	3- 11	6 1/2	+ 1/8	+1.9
N	BUNKER-RAMO	6- 14	8 1/8	+ 3/8	+4.8
A	CALCOMP	11- 33	16 1/8	+2 3/4	+20.5
O	COGNITRONICS	3- 13	3 3/4	0	0.0
O	COLORADO INSTRUMENTS	4- 13	6 3/4	+ 1/4	+3.8
O	COMPUTER COMMUN.	5- 36	8	- 3/4	-8.5
A	COMPUTER EQUIPMENT	4- 12	3 7/8	0	0.0
A	COMPUTEST	14- 28	16 1/4	- 3/8	-2.2
A	DATA PRODUCTS CORP	5- 26	8 1/8	+ 5/8	+8.3
O	DATA TECHNOLOGY	5- 23	5 1/4	+ 1/4	+5.0
O	DIGITRONICS	4- 13	4 1/4	0	0.0
N	ELECTRONIC M & M	7- 40	9 7/8	+ 5/8	+6.7
O	FABRI-TEK	3- 8	3 3/8	+ 1/8	+3.8
O	FARRINGTON MFG	2- 17	2 3/8	- 1/8	-5.0
O	INFORMATION DISPLAYS	5- 20	5 1/4	+ 1/2	+10.5
A	MARSHALL INDUSTRIES	14- 67	23 3/8	+4 1/2	+23.8
A	MILGO ELECTRONICS	15- 84	22 7/8	-1 1/8	-4.6
N	MOHAWK DATA SCI	19- 87	29 1/4	+3 1/2	+13.5
O	OPTICAL SCANNING	11- 52	21	+2 1/2	+13.5
O	PHOTON	4- 17	9	+ 7/8	+10.7
O	PHOTO-MAGNETIC SYS.	1- 4	1 1/2	+ 1/8	+9.0
A	POTTER INSTRUMENT	15- 42	21 1/8	0	0.0
O	PRECISION INST.	6- 25	6 3/4	0	0.0
O	RECOGNITION EQUIP	13- 83	18	+ 1/4	+1.4
O	REDCOR CORP.	4- 34	6 1/2	+ 3/4	+13.0
N	SANDERS ASSOCIATES	7- 29	12	+ 5/8	+5.4
O	SCAN DATA	6- 53	6 1/4	- 1/2	-7.4
O	TALLY CORP.	10- 23	13	+2 1/4	+20.9
N	TELEX	10- 25	12 7/8	+1 1/4	+10.7
O	VIATRON	2- 51	2 1/2	+ 1/4	+11.1
	SUPPLIES & ACCESSORIES				
N	ADAMS-MILLIS CORP	8- 15	11 5/8	- 1/8	-1.0
O	BALTIMORE BUS FORMS	11- 21	11	+ 1/2	+4.7
A	BARRY WRIGHT	6- 25	8 1/8	+ 3/4	+10.1
A	DATA DOCUMENTS	15- 35	18	+2	+12.5
N	ENNIS BUS. FORMS	11- 19	13 3/4	+ 7/8	+6.7
O	GRAPHIC CONTROLS	7- 17	7 1/8	- 1/8	-1.7
N	MEMOREX	46-166	72 1/2	+4 5/8	+6.8
N	3M COMPANTY	71-114	85	-2 3/4	-3.1
O	MOORE BUS. FORMS	27- 38	31 3/4	+ 1/4	+0.7
N	NASHUA CORP	21- 43	27	- 3/4	-2.7
O	REYNOLDS & REYNOLD	25- 48	29	+ 1/2	+1.7
O	STANDARD REGISTER	17- 30	20 1/4	+ 1/4	+1.2
N	UARCO	22- 39	25 1/2	+ 3/4	+3.0
A	WABASH MAGNETICS	7- 30	9 5/8	+1 3/8	+16.6
O	WALLACE BUS FORMS	25- 41	36 1/4	0	0.0
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	78-173	112	+8 1/4	+7.9
N	COLLINS RADIO	9- 37	13 1/4	- 3/8	-2.7
N	CONTROL DATA CORP	30-122	41 1/8	+5 3/8	+15.0
A	DIGITAL EQUIPMENT	50-124	75	+5 1/2	+7.9
N	ELECTRONIC ASSOC.	3- 11	4 3/4	- 1/4	-5.0
A	ELECTRONIC ENGINEER.	3- 14	4 5/8	- 1/2	-9.7
N	FOXBORO	18- 39	22 3/4	+1 7/8	+8.9
O	GENERAL AUTOMATION	9- 42	12	+ 1/2	+4.3
N	GENERAL ELECTRIC	60- 80	78 3/4	+ 1/8	+0.1
N	HEWLETT-PACKARD CO	19- 45	24 1/4	-1 5/8	-6.2
N	HONEYWELL INC	65-152	87 3/8	-1 1/8	-1.2
N	IBM	223-387	269 3/4	+4 1/2	+1.6
N	NCR	30- 86	37 7/8	-1 3/8	-3.5
N	RCA	18- 34	24 3/4	+ 3/4	+3.1
N	RAYTHEON CO	16- 33	20 1/2	+1 3/8	+7.1
O	SCI. CONTROL CORP.	1- 8	1 7/8	- 1/2	-21.0
N	SPERRY RAND	19- 40	23 5/8	+ 7/8	+3.8
A	SYSTEMS ENG. LABS	10- 49	15 3/8	+1 5/8	+11.8
N	VARIAN ASSOCIATES	9- 29	13 1/2	+1 1/8	+9.0
A	WANG LABS.	18- 51	29 1/2	+1 7/8	+6.7
N	XEROX CORP	66-115	80 1/4	+3 7/8	+5.0
	LEASING COMPANIES				
O	BOOTHE COMPUTER	8- 25	11 1/8	+ 7/8	+8.5
O	BRESNAHAN COMP.	3- 9	3 1/4	0	0.0
O	COMPUTER EXCHANGE	2- 8	5 1/2	+ 3/4	+15.7
O	COMPUTER LEASING	3- 18	2 1/2	0	0.0
N	DATA PROC. F & G	6- 32	12	+ 3/4	+6.6
O	DATRONIC RENTAL	2- 8	2 3/4	+ 1/8	+4.7
A	DEARBORN COMPUTER	10- 24	17 5/8	+1 7/8	+11.9
O	DIEBOLD COMP. LEAS.	2- 8	4	- 1/2	-11.1
A	DPA, INC.	3- 10	4 1/8	- 1/4	-5.7
A	GRANITE MGT	7- 22	10 3/4	+ 3/4	+7.5
A	GREYHOUND COMPUTER	5- 44	7 1/4	0	0.0
N	LEASCO DATA PROC.	7- 30	11 1/2	+1 1/2	+15.0
O	LECTRO COMP LEAS	2- 9	2 1/2	-6 5/8	-72.6
A	LEVIN-TOWNSEND CMP	3- 19	5 3/8	- 1/8	-2.2
O	LMC DATA, INC.	1- 3	1 1/4	- 1/8	-9.0
O	MANAGEMENT ASSIST	1- 4	1 5/8	0	0.0
O	NCC INDUSTRIES	3- 8	+4 5/8	+ 7/8	+23.3
O	SYSTEMS CAPITAL	2- 8	1 1/2	- 3/8	-20.0
A	U.S. LEASING	3- 19	13 1/8	+ 1/8	+0.9

EXCH: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE
L=NATIONAL EXCHANGE; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Computer Stocks Trading Index



BASE FOR EACH TRADING INDEX: 100 as of 3/1/68

Earnings Reports

BOOTHE COMPUTER
Three Months Ended June 30

	1970	1969
Shr Ernd	$.41	a$.39
Revenue	10,275,000	9,552,000
6 Mo Shr	.80	a.77
Revenue	20,497,000	18,586,000
Earnings	1,503,000	1,407,000

a-Adjusted to reflect payment of 10% stock dividend in June, 1970.

Fully diluted per-share earnings were 37 cents in the quarter and 73 cents in the six months, compared with 34 cents and 68 cents, respectively in the like periods of 1969.

BUNKER RAMO CORP.
Three Months Ended June 30

	1970	a1969
Shr Ernd	$.16	b$.15
Revenue	62,092,305	67,209,313
Spec Cred	c470,500	.....
Earnings	3,632,971	e3,947,468
6 Mo Shr	.28	b.27
Revenue	123,624,867	129,263,645
Spec Cred	.....	c792,000
Earnings	6,506,248	e7,125,050

a-Adjusted to reflect on a pro rata basis the loss from the disposition of the former White Way Sign Division, effective Jan. 1, 1970, and to reflect pro rata changes in the income tax law for investment credit carry-forwards. b-Based on income before special credit. c-From tax loss carry-forward, offset in part by provision for loss on disposition of certain assets. e-Equal to 17 cents a share in the quarter and 31 cents a share in the half.

MANAGEMENT ASSISTANCE CORP.
Three Months Ended June 30

	1970	1969
Revenue	$15,696,280	$17,623,372
Loss	1,608,193	641,751
9 Mo Rev	48,680,865	54,006,162
Loss	3,809,676	1,153,574
Spec Cred	a2,160,000	.....
Loss	1,649,676	1,153,574

a-Legal settlement from Potter Instrument Co.

INFOTRONICS CORP.
Three Months Ended June 30

	1970	1969
Shr Ernd	$.05	$.10
Revenue	1,796,178	1,645,171
Earnings	55,172	93,531

a-Includes 100,000 unissued shares associated with warrants attached to senior subordinated notes issued on March 31, 1970.

VARIAN ASSOCIATES
Nine Months Ended July 3

	1970	a1969
Shr Ernd	$.63	b$.65
Revenue	148,007,000	140,603,000
Spec Cred	.....	c1,251,000
Earnings	4,383,000	e5,709,000

a-Restated to include results of Pulse Engineering of Nevada Inc. b-Based on income before special credit. c-Consists of $1,001,000 gain on sale of facility and $250,000 gain on sale of equity interest in French joint venture. e-Equal to 84 cents a share.

LECTRO COMPUTER LEASING
Six Months Ended June 30

	1970	1969
Shr Ernd	$.25	$.20
Revenue	670,744	362,006
Earnings	109,001	69,186

On a diluted basis, per share earnings as reported by the company were 21 cents in 1970 and 20 cents in 1969.

SANGAMO ELECTRIC CO.
Three Months Ended June 30

	1970	1969
Shr Ernd	$.20	$.12
Revenue	22,520,000	19,671,000
Earnings	541,000	326,000
6 Mo Shr	.29	.27
Revenue	42,663,000	36,963,000
Earnings	798,000	744,000

SCANTLIN ELECTRONICS
Six Months Ended June 30

	1970	1969
Shr Ernd	.....	a$.04
Revenue	$4,655,000	4,687,000
Earnings (Loss)	(246,000)	89,612
Spec Cred Earnings (Loss)	..... (246,000)	b95,153 c184,765

a-Based on income before special credit. b-From carry-forward of operating losses. c-Equal to nine cents a share.

DIEBOLD COMPUTER LEASING
Three Months Ended June 30

	1970	1969
Shr Ernd	$.11	$.12
Revenue	8,172,000	7,726,000
Earnings	446,000	483,000
6 Mo Shr	16,331,000	14,961,000
Earnings	827,000	910,000

On fully diluted basis share earnings would be 10 cents versus 11 cents for the quarter and 19 cents in both years for the six months.

Concept and design

Gilbert F. Curtis

An honors graduate of Princeton, Gil Curtis is perhaps the industry's most skilled designer of generalized business software systems. Certainly Curtis-designed systems are operating very successfully in literally hundreds of major corporations throughout the U. S.

From this experience evolved the obvious need for a powerful report generator. One that would be easy to use, yet so powerful and fast it could be used as a report utility as well as for on-demand reports. In other words . . . CULPRIT.

Design and implementation

Anna Marie was literally a co-designer of CULPRIT and the major implementor. A skilled programmer, Anna Marie was able to perform basic CULPRIT functions in virtually I/O time, thus making CULPRIT unbelievably fast.

Anna Marie was at one time a member of the staff of Arthur D. Little, Inc., engaged in product development. Later, she spent a number of years in software design and development. Mrs. Thron holds a B.A. degree in chemistry from Beaver College, Pa.

Anna Marie Thron

Interface with data base language

James J. Baker

Jim Baker is an M.I.T. graduate (math major and honor society member) who has completed requirements for his Phd at Harvard.

Prior to joining Cullinane Corporation, Jim spent 5 years in advanced software system development at I.B.M. Therefore, Jim was the logical choice to develop the IMS/data language 1 interface module . . . which allowed CULPRIT to enhance the report generator capability of DL 1.

Jim was also a major contributor to the OS version of CULPRIT.

Documentation

An engineer with a B.S. in E.E. from Michigan State, Ken spent many years in electronics research and software review and evaluation before joining Cullinane Corporation.

He authors a monthly column on software for Modern Data magazine and knows exactly what the user looks for in terms of really effective documentation.

So when Ken wrote the user's manual for CULPRIT he put himself entirely in the user's position. Example: he devoted a major effort to a self-teaching section for junior level personnel . . . but at the same time included substantial material for the advanced CULPRIT user.

Kenneth Falor

Meet the people behind the most important software package of 1970: new CULPRIT.

Before many months are out the chances are you'll be using CULPRIT. Wherever it has been shown it has generated intense interest. The list of sales is growing quite rapidly. And it is the type of package literally *everyone* needs.

So we thought you'd like to meet a few of the more important people behind it. There are others. Perhaps a dozen Cullinane staff members had some part in CULPRIT. But these are the four who deserve the credit.

CULPRIT brought us a few surprises. Particularly in speed. While we designed it for flexibility and ease in use CULPRIT turned out to be much faster than our most optimistic estimates. Otherwise it performs exactly as planned.

And what we planned was an easy-to-use report generator and information retrieval system that would allow you to respond to on-demand report requests regardless of report complexity. One that was so efficient it could be used as the report utility in production systems.

How CULPRIT differs

Many report generators can produce only one report from one pass of the data file. Others produce a Cobol program which must be compiled, link edited and run before they produce a report. Some even have both problems. That's Model T designing!

CULPRIT is a parameter-driven program. No compiling needed. The program is kept on the core image library like a utility and produces a report as directed by the parameter coding. Highly efficient, it produces many reports (up to 99) with a single pass and can extract from multiple input files.

CULPRIT requires from 1/10 to 1/40 the normal coding time. This means that the most junior-level programmer can request and get a simple one-time report in minutes. Or many complex reports in one pass . . . with just a few hours of coding. Not weeks. Hours! But fast reports are not all that CULPRIT can do for you.

New Systems

When you design a new system, how much of it is made up of report editing programs? Half? A third? Then you can put your new system on the air nearly one-third to one-half sooner by simply plugging new CULPRIT into the system to handle the reporting requirements. You not only save programming time, but the machine time usually needed for debugging this part of the system.

Processing speeds are close to those for well-designed and laboriously hand-coded programs. Remember . . . this isn't an ordinary report generator. You just load and go.

Features

CULPRIT has multi-line output for address labels, notices, etc. Other options include header variables; multiple-lines in headers, detail and totals; separately specifiable total lines; calculation ability on both detail and total levels; use of memonics for working fields; and many others. Output may be printer, punched cards, tape or disk . . . permitting program and test file creation and conversion.

Find out for yourself!

Send for a complete 15 page technical report. Or, if you'd rather discuss CULPRIT directly with one of the above people (or equally well-qualified Cullinane staff members), pick up your phone and dial (617) 742-8656. You really ought to know about CULPRIT. Don't pass up the chance!

Name.....

Title.....

Company.....

Address.....

City.....State.....Zip.....

Phone.....

Cullinane Corporation

60 State St., Boston, Mass. 02109 Phone: (617) 742-8656. Other offices in New York, St. Louis, and London.